UNC
ENVIRONMENT, HEALTH & SAFETY

The University of North Carolina at Chapel Hill
Department of Environment, Health & Safety
1120 Estes Drive, CB# 1650
Chapel Hill, North Carolina 27599-1650

March 16, 2018

Mark Cuilla
Title V Permits Branch Supervisor
NC DEQ – Division of Air Quality
1641 Mail Service Center
Raleigh, NC 27699-1641

Subject: 15A NCAC 2Q .0515 Minor Air Permit Modification Application
Dry Sorbent Injection (DSI) Systems and Federal Boiler MACT Provisions
The University of North Carolina at Chapel Hill
Title V Air Permit No. 03069T34

Dear Mr. Cuilla:

As we discussed in our preapplication meeting on February 14, 2018, the University of North Carolina at Chapel Hill is providing three (3) copies of a Rule .0515 minor air permit modification application for your review. The minor permit application is for the installation of dry sorbent injection (DSI) systems on each of two (2) coal-fired boilers at our Cogeneration Facility, and incorporation of 15A NCAC 2D .1111 Boiler MACT provisions applicable to six (6) existing boilers into the permit before May 23, 2019. The DSI systems are being installed to ensure compliance with the 15A NCAC 2D .1111 Boiler MACT hydrogen chloride (HCl) emission limits by May 23, 2019.

The application package also contains a minor permit application processing fee of $947.00 and a request for a zoning consistency determination from the Town of Chapel Hill.

We appreciate your review of this application. If you have any questions or comments, please call me at (919) 962-6666 or Butch Smith of RST Engineering at (919) 810-9875 any time at your convenience.

If you have any questions or require additional information, please call me at 919.962.6666.

Sincerely,

J. Laurence Daw, L.G.
Environmental Compliance Officer

Attachment

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The University of North Carolina at Chapel Hill
Department of Environment, Health & Safety
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Attachment

Title V Minor Permit Modification Application

Dry Sorbent Injection on Boiler Nos. 6 and 7 And 15A NCAC 2D .1111 Boiler MACT Compliance for Six (6) Boilers

The University of North Carolina at Chapel Hill
Chapel Hill, North Carolina
Facility ID # 6800043
Air Permit # 03069T34

Prepared For:
The University of North Carolina at Chapel Hill
Cogeneration Systems
575 W. Cameron Ave., CB 1858
Chapel Hill, North Carolina 27599-1858

Prepared By:
RST Engineering, PLLC
5416 Orchard Oriole Trail
Wake Forest, North Carolina 27587-6770

February 2018

Table of Contents

I. Introduction

The University of North Carolina at Chapel Hill (University) operates a 760-acre campus located in Chapel Hill, North Carolina. The University's principal sources of regulated air pollutant emissions include a Cogeneration Facility on W. Cameron Avenue near the main campus and a Steam Plant on Manning Drive near the UNC Hospitals complex. Emission sources at the Cogeneration Facility include two (2) 323.17 MMBtu/hr coal, natural gas, wood, and distillate oil-fired boilers (Boiler Nos. 6 and 7) and one (1) 338 MMBtu/hr natural gas and distillate oil-fired boiler (Boiler No.8). Emission sources at the Manning Drive Steam Plant are two (2) 249 MMBtu/hr natural gas and distillate oil-fired boilers (Boiler Nos. 9 and 10). In addition to the large boilers at the Cogeneration Facility and Manning Drive Steam Plant, the University also operates a small 2.52 MMBtu/hr natural gas-fired steam boiler at Davie Hall. The five (5) large boilers at the Cogeneration Facility and Manning Drive Steam Plant, and the small natural gas-fired boiler at Davie Hall, are currently subject to the state's Rule 15A NCAC 2D .1109: Clean Air Act (CAA) Section 112(j) Case-by-Case MACT for Boilers & Process Heaters [112(j) MACT] until May 22, 2019. The term MACT refers to "Maximum Achievable Control Technology". As presented in the current Title V Air Permit No. 03069T34, these six (6) boilers will become subject to the state's Rule 15A NCAC 2D .1111 MACT which implements the federal Boiler MACT regulations (Boiler MACT) promulgated in 40 CFR 63, Subpart DDDDD effective May 23, 2019.

The state's current 112(j) MACT and the federal Boiler MACT both present emission limits for hydrogen chloride (HCl) for Boiler Nos. 6 and 7 at the Cogeneration Facility when these units are firing coal and/or wood-based fuels. The current 112(j) HCl emission limit for Boiler Nos. 6 and 7 is a risk-based standard of a maximum 435.5 lbs/hr of HCl-equivalent emissions from the common stack serving both boilers. The federal Boiler MACT limit for both boilers when firing coal and/or wood-based fuels effective May 23, 2019 is a much more stringent limit of 0.022 lb/MMBtu of heat input. By comparison, at the maximum firing rate of 323.17 MMBtu/hr for each boiler, the federal Boiler MACT 0.022 lb/MMBtu HCl limit is equivalent to a maximum of only 7.11 lb/hr from each boiler, with a total of 14.22 lbs/hr of HCl from the common stack, versus the currently allowed 112(j) MACT HCl limit of 435.5 lb/hr. Boiler Nos. 6 and 7 are currently equipped with limestone ($CaCO_3$) injection systems and baghouses for the control of sulfur dioxide (SO_2) at $\geq$90% control in compliance with NSPS 40 CFR 60, Subpart Db. The existing limestone injection systems and baghouses also provide some limited HCl control. However, a review of the available emission test data for HCl emissions from Boiler Nos. 6 and 7 indicates that the existing limestone injection/baghouse control systems may have difficulty meeting the Boiler MACT 0.022 lb/MMBtu limit, when the units are firing moderate to high chlorine content coals.

With this permit application, the University is proposing to add a dry sorbent injection system (DSI) on each of Boiler Nos. 6 and 7 to supplement the existing HCl control provided by the limestone injection/baghouse systems and ensure compliance with the Boiler MACT HCl limit. The University is also requesting that the Title V permit be revised to replace the current 112(j) MACT provisions applicable to all six (6) boilers with the federal Boiler MACT provisions effective May 23, 2019. The University is requesting that this permit application be processed as a minor permit modification as specified in Rule 15A NCAC 2Q .0515.

II. Rule 15A NCAC 2Q .0515 Minor Permit Modification

Because of the concerns regarding the time required for final design and installation of the proposed DSI systems on Boiler Nos. 6 and 7 by May 23, 2019, the University is requesting that this permit application be processed as a minor Title V permit modification under Rule 15A NCAC 2Q .0515 (Rule .0515). Rule .0515(f) specifies that a permit applicant may make changes proposed in a minor permit modification immediately after filing a completed application with the Division of Air Quality.

Under Rule .0515(b), a complete Title V permit application requesting processing as a minor modification must include:

(1) an application form(s) including:
  (A) a description of the change,
  (B) the emissions resulting from the change, and
  (C) identification of any new applicable requirements that will apply if the change occurs;
(2) a list of the facility's other pending applications awaiting group processing;
(3) the applicant's suggested draft permit;
(4) certification by a responsible official that the proposed modification meets the criteria for using the procedures set out in this Rule and a request that these procedures be used; and
(5) complete information for DAQ to use to notify EPA and affected States.

Each of these items is discussed in the following Sections of this application.

III. Description of Proposed Change(s)

The changes to the current Title V permit proposed in this application can be characterized as (1) new equipment associated with the DSI systems to be installed on Boiler Nos. 6 and 7 by May 23, 2019, and (2) regulatory changes to the Title V permit for removal of the current 112(j) MACT provisions and incorporation of the federal Boiler MACT provisions by May 23, 2019. Each of these changes is discussed in the following paragraphs.

A. Proposed Dry Sorbent Injection (DSI) Systems on Boiler Nos. 6 and 7

Under the direction of the N.C. Division of Purchase & Contract, the University plans to enter into a design/build contract with an engineering/construction firm for the installation of the DSI systems on each of Boiler Nos. 6 and 7. The design/build contract will allow for ongoing concurrent detailed system design and equipment installation under the minor permit modification, and will facilitate completion of the project by May 23, 2019. This permit application presents an overview of the conceptual design of the proposed DSI systems in the level of detail believed to be necessary for air permitting purposes.

The two (2) DSI systems on Boiler Nos. 6 and 7 will each consist of a sorbent storage silo with a bin vent filter, weigh/feed hoppers with bin vent filters, rotary air locks, blowers, piping, and

injection nozzles to inject the sorbent into the boiler exhaust ductwork before the existing baghouses. Permit applications forms (B, B1, C9, E3s) for Boiler Nos. 6 and 7 associated with the new DSI systems are presented with this application. The application also includes figures and conceptual schematics of the proposed systems and revised emission calculations for Boiler Nos. 6 and 7 for the worse-case 100% coal-fired operating scenario. All preliminary design information and associated emission calculations presented in this application are based on injection of commercially available calcium hydroxide [$Ca(OH)_2$] sorbent, typically referred to as hydrated lime. However, the University may choose to use a proprietary enhanced $Ca(OH)_2$ sorbent to reduce the amount of sorbent actually required to meet the 0.022 lb/MMBtu Boiler MACT HCl limit.

The required sorbent injection rate to achieve the HCl emission limit on each boiler is dependent on several factors including the coal/wood firing rate, the coal/wood heating value, the chlorine content of the coal/wood, the sorbent residence time, scavenging of sorbent by other pollutants (SO_2), and sorbent particle size. Because of the inherent inefficiency (<100%) in any control system, excess sorbent above the stoichiometric amount to react with a given amount of HCl is generally required to achieve a desired control efficiency. The required excess sorbent is often quantified as the stoichiometric rate which is the ratio of the sorbent actually required to the theoretical sorbent required to react with the acid gas. The preliminary design capacity of the proposed DSI system on each of Boiler Nos. 6 and 7 is a maximum injection rate of 400 lbs/hr of sorbent. The Boiler MACT will require that actual sorbent injection rates during HCl compliance tests be used to establish surrogate sorbent injection rate operating limits to monitor for demonstrating continuous compliance with the HCl 0.022 lb/hr limit. The format of the sorbent injection rate operating limits will be in units of the maximum lbs coal/lb sorbent. The actual sorbent injection rates required to meet the 30-day rolling average Boiler MACT HCl limits on a continuing basis are expected to be lower than the 400 lb/hr capacity of each system. The initial performance tests to establish the sorbent injection rate operating limits must be performed within 180-days after May 23, 2019.

The existing emission control systems on Boiler Nos. 6 and 7 include limestone injection into the boiler furnaces for acid gas control, with baghouses on the boiler exhausts to control PM. Both Boiler Nos. 6 and 7 are currently equipped with a limestone injection continuous parameter monitoring system (CPMS) that measures the concurrent coal/wood firing rate and limestone injection rate, and calculates the corresponding coal/wood: limestone feed rate ratios. With installation of the DSI systems, a duct sorbent injection CPMS will also be installed on each boiler to monitor the coal/wood: duct sorbent injection rate ratios.

While each DSI system constitutes an emissions control device, the sorbent storage silos, weigh/feed hoppers, and associated bin vent filters also constitute a potential source of particulate emissions (PM). However, calculations included with this application show that maximum potential uncontrolled PM_{10} emissions from these sources are well below the 5.0 ton/yr permitting exclusion threshold presented in Rule 15A NCAC 2Q .0102(h)(5).

B. Regulatory Changes to the Title V Permit to Incorporate the Boiler MACT Provisions

With this permit application, the University is requesting that the Title V permit be revised to replace the current 112(j) MACT provisions applicable to all six (6) on campus boilers with the federal Boiler MACT provisions effective May 23, 2019. The current permit list specific 112(j) MACT emission limits, operating limits, work practice standards, and performance testing, monitoring, and reporting requirements for each of the six (6) boilers. Ultimately, the Title V permit must be revised to incorporate the new specific federal Boiler MACT provisions applicable to each of the six (6) boilers. However, the level of effort associated with revising the permit to incorporate in detail all the new Boiler MACT provisions is expected to be extensive and is not necessary before May 23, 2019, since the current 112(j) MACT provisions will remain applicable until May 22, 2019. Because of the concerns regarding the time required for final design and installation of the proposed DSI systems on Boiler Nos. 6 and 7 by May 23, 2019, the University is requesting that this permit application be processed as a minor Title V permit modification under Rule 15A NCAC 2Q .0515. As noted earlier, processing of this application as a minor modification will allow the University to begin design/installation of the DSI systems on Boiler Nos. 6 and 7 immediately upon notification from DAQ that this application is deemed to be complete. Preparation of a minor permit modification application defining in detail each of the new Boiler MACT emission limits, operating limits, work practice standards, and performance testing, monitoring, and reporting requirements for each of the six (6) boilers could take considerable time and potentially delay submittal of the application and beginning design/installation of the DSI systems that must be completed by May 23, 2019. The University discussed this issue with DAQ at a preapplication meeting held on February 14, 2018. During this preapplication meeting, DAQ indicated that a generic interim permit condition requiring compliance of the boilers with the federal Boiler MACT by May 23, 2019 would be sufficient at this time to allow processing of this permit application as a minor modification. The DAQ has provided the University with the suggested interim permit condition(s) to ensure compliance with the Boiler MACT by May 23, 2019. The suggested interim permit condition(s) are presented in Section VII. below. The University is requesting that these interim permit condition(s) be incorporated into the revised minor air permit modification with this application.

IV. Emissions Resulting from the Proposed Changes

The six (6) boilers at the University subject to the Boiler MACT emit numerous regulated criteria and hazardous/toxic air pollutants. With this application, there will be no change in emissions from Boiler Nos. 8, 9, 10, and SB-6. The only boilers with any proposed equipment modifications (DSI installation) potentially affecting current emission rates are Boiler Nos. 6 and 7. Calculations of potential pollutant emission rates from Boiler Nos. 6 and 7 after installation of the DSI systems are included in this application. With the exception of HCl, emission rates of these pollutants are all well below the applicable emission limits. Calculated HCl emission rates are based on the new Boiler MACT 0.022 lb/MMBtu limit.

The Boiler MACT will result in new emission limits for only four (4) pollutants, filterable PM, HCl, Hg, and CO. With installation of the proposed DSI systems on Boiler Nos. 6 and 7, there will be no change in the current CO emission rates. The new Boiler MACT CO limit for coal

combustion will be 130 ppmv at 3% O_2. Previous performance tests indicate actual CO concentrations of only 25-35 ppmv at 7% O_2 from these boilers when firing 100% coal.

There will be no potential increase in mercury (Hg) emissions with installation of the DSI systems. However, it is conceivable that sorbent injection into the exhaust ductwork, which will provide more particles for condensation nuclei for Hg compounds, with subsequent capture by the baghouses, could potentially reduce Hg emissions. However, this potential reduction has not been quantified in this application. The initial Hg performance tests after installation of the DSI systems will indicate whether there is any significant reduction in Hg emissions. The new Boiler MACT Hg limit for coal combustion will be 5.7E-06 lb/MMBtu. Previous performance tests indicate current Hg emission rates of only 2.75E-07 – 4.30E-07 lb/MMBtu from these boilers when firing 100% coal.

The DSI systems to be installed on Boiler Nos. 6 and 7 are for the primary purpose of reducing HCl emissions to ensure compliance with the Boiler MACT 0.022 lb/MMBtu limit. The results of previous HCl performance tests are presented in this application. The previous performance tests indicate current HCl emission rates that range from 0.013-0.122 lb/MMBtu. The variation in HCl emissions is primarily due to the variation in the chlorine content of the coals burned during the tests. Calculations are included in this application that show a maximum potential uncontrolled HCl emission rate of 0.165 lb/MMBtu based on combustion of a 12,500 Btu/lb coal with a 2,000 ppmwt. chlorine content. The minimum combined HCl control efficiency to meet the 0.022 lb/MMBtu limit for this worse-case coal required by the existing limestone injection systems (into the furnace) and the add-on DSI systems is 86.6%. The initial Boiler MACT performance tests will be used to establish the necessary limestone injection and duct sorbent injection rate operating limit(s) to ensure compliance with the new HCl limit.

The only pollutant with a potential emissions increase resulting from the installation of the proposed DSI systems is filterable PM. This potential increase is due to increased reacted and unreacted sorbent dust loadings to the baghouses, and insignificant PM emissions from the new DSI sorbent storage silos and weigh/feed hoppers. Calculations of potential filterable PM emissions from the storage silos are included with this application. The calculated potential controlled PM emissions from the silos are based on a maximum potential 400 lbs/hr (1,752 ton/yr) sorbent use rate per boiler and an AP-42 (§11.12) emission factor of 0.00099 lb/ton for controlled PM. The AP-42 emission factor is for pneumatically loaded (air conveyed) elevated cement storage silos equipped with bin vent filters at concrete batch plants. Based on the maximum annual sorbent loading rate and the AP-42 emission factor, potential filterable PM emission increases associated with each new sorbent storage silo would be only 1.73 lb/yr. Potential filterable PM emissions from the weigh/feed hoppers would be even lower since these units will not be pneumatically loaded. Calculations of maximum potential filterable PM loading increases to the baghouses and maximum potential filterable PM emission increases from the baghouses associated with the new DSI systems are also included with this application. At the maximum 400 lb/hr potential sorbent injection rate and worse-case uncontrolled HCl emissions associated with a 12,500 Btu/lb coal with a 2,000 ppmwt. chlorine content at the maximum firing rate of each boiler (323.17 MMBtu/hr), the calculated increased reacted and unreacted filterable PM loadings to each baghouse is a maximum of 423.3 lb/hr. At an assumed 99.8% control efficiency for each baghouse, controlled filterable PM emissions could potentially increase by

0.847 lb/hr. At the maximum 323.17 MMBtu/hr firing rate of each boiler, the 0.847 lb/hr increase is equivalent to 0.0026 lb/MMBtu. Previous performance tests indicate current filterable PM emission rates of only 0.0025 – 0.0040 lb/MMBtu from these boilers when firing 100% coal. If the filterable PM after installation of the DSI increased by the potential 0.0026 lb/MMBtu rate calculated, the new total filterable PM would be a maximum of only 0.0066 lb/MMBtu versus the Boiler MACT limit of 0.04 lb/MMBtu. While the calculated potential increase is low, it is also believed that any actual increase would be insignificant due to the nature of the baghouse air filtering process. It is well documented that the dust cake on baghouse bags actually performs the air filtration process and not the bags themselves. Typically, a given baghouse on a particular source (consistent filter cake composition) will have a consistent penetration rate (gr/dscf) that does not vary with the dust loading to the baghouse. Because of this factor, controlled emissions from the baghouses would not be expected to have any significant increase in controlled emissions associated with installation of the DSI. However, the increased dust loadings to the baghouses may require more frequent bag cleaning,

V. Identification of New Applicable Requirements

The current Title V permit lists specific 112(j) MACT emission limits, operating limits, work practice standards, and performance testing, monitoring, and reporting requirements for each of the six (6) boilers. Ultimately, the Title V permit must be revised to incorporate the new specific federal Boiler MACT provisions applicable to each of the six (6) boilers effective May 23, 2019. However, the current Title V permit already contains a generic statement for each affected boiler that the unit must comply with the federal Boiler MACT by May 23, 2019. Therefore, compliance with the Boiler MACT provisions by May 23, 2019 does not actually constitute a new applicable requirement.

The only changes that may be construed to constitute new applicable requirements is the need to (1) install a duct sorbent injection rate CPMS for HCl compliance monitoring on Boiler Nos. 6 and 7, and (2) install PM CEMS on Boiler Nos. 6 and 7 for compliance monitoring for filterable PM. Under the current 112(j) MACT provisions, compliance monitoring for PM is performed with opacity COMS.

VI. Other Pending Applications Awaiting Group Processing

The University currently has three (3) other pending active air permit applications:

1. Title V Permit Renewal.
2. 112(j) Limestone Injection/O_2 Analyzer Operating Limits for Boiler Nos. 6 and 7.
3. New Diesel-fired Fire Pump at the Davis Library.

It is not believed that these applications are awaiting group processing.

VII. Suggested Draft Permit

The University discussed this requirement with DAQ at the preapplication meeting held on February 14, 2018. DAQ indicated that a generic interim permit condition requiring compliance of the boilers with the federal Boiler MACT by May 23, 2019 would be sufficient at this time to allow processing of this permit application as a minor modification. The DAQ provided the University with the suggested interim permit condition(s) to ensure compliance with the Boiler MACT by May 23, 2019. The suggested interim permit condition(s) is presented below. The University is requesting that the interim permit condition(s) be incorporated into the revised minor air permit modification with this application.

15A NCAC 2D .1111: MAXIMUM ACHIEVABLE CONTROL TECHNOLOGY

Applicability [40 CFR 63.7485, §63.7490(d), §§63.7499(j),p)]

a. For the existing source(s) (boiler(s) ID No(s). ES-001, 002, 003, 004, 005, & SB-6), the Permittee shall comply with all applicable provisions, including the monitoring, recordkeeping, and reporting contained in Environmental Management Commission Standard 15A NCAC 2D .1111 "Maximum Achievable Control Technology" (MACT) as promulgated in 40 CFR 63, Subpart DDDDD . "National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters" and Subpart A "General Provisions." The Permittee shall comply no later than **May 23, 2019**.

Definitions and Nomenclature [§63.7575]

b. For the purpose of this permit condition, the definitions and nomenclature contained in 40 CFR 63.7575 shall apply.

40 CFR Part 63 Subpart A General Provisions [§63.7565]

c. The Permittee shall comply with the requirements of 40 CFR 63 Subpart A General Provisions according to the applicability of Subpart A to such sources as identified in Table 10 to 40 CFR Part 63, Subpart DDDDD.

Notifications [§63.7545]

d. The Permittee shall submit the following notifications:
   i. Notification of intent to conduct a performance test at least 60 days before the performance test is scheduled to begin.
   ii. Notification of intent to conduct a performance evaluation of the CMS(s) simultaneously with the notification of the performance test date required, or at least 60 days prior to the date the performance evaluation is scheduled to begin if no performance test is required. [§63.8(e)]

e. The Permittee shall submit, for the initial compliance demonstration for each affected unit, a Notification of Compliance Status report, including all performance test results and fuel analyses, before the close of business on the 60th day following the completion of all performance test and/or other initial compliance demonstrations for all boiler or process heaters at the facility according to §63.10(d)(2). The Notification of Compliance Status

report must contain all the information specified in §63.7545 (e)(1) through (8), as applicable.

General Compliance Requirements [§63.7505(a), §63.7500]

f. At all times the affected unit(s) is operating, the Permittee shall be in compliance with the emission standards in condition a. above, except during periods of startup and shutdown.

g. At all times, you must operate and maintain any affected source, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Administrator that may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the source.

VIII. Certification That Proposed Modification Meets Rule .0515 Criteria

A signed certification by the Responsible Official that the proposed modification(s) in this application meets the criteria for using the minor modification procedures set out in Rule 15A NCAC 2Q .0515 and a request that these procedures be used is presented on the following page.

IX. Information for DAQ Notification of EPA and Affected States

It is believed that this permit application provides complete information for DAQ to use to notify EPA and affected States if necessary. If any additional information is required, the University will provide the additional information requested.

report must contain all the information specified in §63.7545 (e)(1) through (8), as applicable.

General Compliance Requirements [§63.7505(a), §63.7500]

f. At all times the affected unit(s) is operating, the Permittee shall be in compliance with the emission standards in condition a. above, except during periods of startup and shutdown.

g. At all times, you must operate and maintain any affected source, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Administrator that may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the source.

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It is believed that this permit application provides complete information for DAQ to use to notify EPA and affected States if necessary. If any additional information is required, the University will provide the additional information requested.

Certification By Responsible Official

Based on the information presented in this permit modification application and the criteria presented in Rule 15A NCAC 2Q .0515, the undersigned certifies that the proposed modifications meet the criteria for using the procedures presented in Rule .0515 for processing of the application as a minor permit modification, and requests that these procedures be used to process this application.

J. Pruitt — *(Signature of Responsible Official)*

3-16-18 — *(Date)*

Name: Jonathan Pruitt, Vice Chancellor for Finance and Operations

Received
MAR 19 2018
Air Permits Section

The University of North Carolina at Chapel Hill
Chapel Hill, North Carolina
Orange County

Permit Application Forms and Supporting Information

FORM A1

FACILITY (General Information)

REVISED 11/01/02 — NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate — A1

NOTE- APPLICATION WILL NOT BE PROCESSED WITHOUT THE FOLLOWING:

☑ Local Zoning Consistency Determination (if required) ☑ Facility Reduction & Recycling Survey Form (Form A4) ☑ Application Fee
☑ Responsible Official/Authorized Contact Signature ☑ Appropriate Number of Copies of Application ☑ P.E. Seal (if required)

GENERAL INFORMATION

Legal Corporate/Owner Name: **The University of North Carolina at Chapel Hill**
Site Name: **The University of North Carolina at Chapel Hill**
Site Address (911 Address) Line 1: **200 E. Cameron Avenue, CB#1000**
Site Address Line 2:
City: **Chapel Hill** State: **North Carolina**
Zip Code: **27599-1000** County: **Orange**

CONTACT INFORMATION

Permit/Technical Contact:
Name/Title: **Larry Daw/Environmental Compliance Officer**
Mailing Address Line 1: **The University of North Carolina at Chapel Hill**
Mailing Address Line 2: **1120 Estes Drive, CB#1650**
City: **Chapel Hill** State: **North Carolina** Zip Code: **27599-1650**
Phone No. **(919) 962-6666** Fax No. **(919) 962-0227**
Email Address: jldaw@ehs.unc.edu

Facility/Inspection Contact:
Name/Title: **Larry Daw/Environmental Compliance Officer**
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Mailing Address Line 2: **1120 Estes Drive, CB#1650**
City: **Chapel Hill** State: **North Carolina** Zip Code: **27599-1650**
Phone No. **(919) 962-6666** Fax No. **(919) 962-0227**
Email Address: jldaw@ehs.unc.edu

Responsible Official/Authorized Contact:
Name/Title: **Jonathan Pruitt**
Vice Chancellor for Finance & Operations
Mailing Address Line 1: **The University of North Carolina at Chapel Hill**
Mailing Address Line 2: **200 E. Cameron Ave., CB#1000**
City: **Chapel Hill** State: **North Carolina** Zip Code: **27599-1000**
Phone No. **(919) 962-3795** Fax No. **(919) 962-0647**
Email Address: jpruitt@unc.edu

Invoice Contact:
Name/Title: **Larry Daw/Environmental Compliance Officer**
Mailing Address Line 1: **The University of North Carolina at Chapel Hill**
Mailing Address Line 2: **1120 Estes Drive, CB#1650**
City: **Chapel Hill** State: **North Carolina** Zip Code: **27599-1650**
Phone No. **(919) 962-6666** Fax No. **(919) 962-0227**
Email Address: jldaw@ehs.unc.edu

APPLICATION IS BEING MADE FOR

☐ New Non-permitted Facility/Greenfield ☑ Modification of Facility (permitted) ☐ Renewal with Modification
☐ Renewal (TV Only)

FACILITY CLASSIFICATION AFTER APPLICATION (Check Only One)

☐ General ☐ Small ☐ Prohibitory Small ☐ Synthetic Minor ☑ Title V

FACILITY (Plant Site) INFORMATION

Describe nature of (plant site) operation(s):

Educational Institution

Primary SIC/NAICS Code: **8221/611310**
Current/Previous Air Permit No. **03069T34** Expiration Date: **3/31/21**
Facility Coordinates: Latitude: **35° 54' 24.8"** Longitude: **-79° 03' 43.8"**
Does this application contain confidential data? ☐ YES ☑ NO

PERSON OR FIRM THAT PREPARED APPLICATION

Person Name: **Butch Smith, PE**
Firm Name: **RST Engineering, PLLC**
Mailing Address Line 1: **5416 Orchard Oriole Trail**
Mailing Address Line 2:
City: **Wake Forest** State: **North Carolina**
Zip Code: **27587-6770** County: **Wake**
Phone No. (area code) **(919) 810-9875** Fax No. (area code)
Email Address: butch50@nc.rr.com

SIGNATURE OF RESPONSIBLE OFFICIAL/AUTHORIZED CONTACT

Name (typed): **Jonathan Pruitt**
Title: **Vice Chancellor for Finance and Operations**
X Signature(Blue Ink)
Date: 3-16-18

Attach Additional Sheets As Necessary

Received
MAR 19 2018
Air Permits Section

REVISED 10/17/2014

Title V Minor Modification (Prior to Permit Revision)

FORM A1 - MINOR

MINOR MODIFICATION QUALIFICATION CHECKLIST

☑	This change does not violate any existing requirement in the current Title V air quality permit.
☑	This change does not result in any significant change in existing monitoring, reporting or recordkeeping provisions in my current permit.
☑	This change does not require a case-by-case determination (e.g. BACT)
☑	This change is not a modification under Title I of the federal Clean Air Act.
☑	This change is not a significant modification. (See 15A NCAC 2Q .0516)
☑	This change does not require a change to an existing permit term that was taken to avoid an applicable requirement. (e.g. PSD avoidance condition)
☑	This change does not require a permit under the NC Toxics program.

MINOR MODIFICATION DESCRIPTION

Provide Description of Modification (e.g. Adding emergency generator) **The proposed modification is to install a Dry Sorbent Injection (DSI) system on the exhaust of each of the two (2) coal/wood fired Boiler Nos. 6 & 7 at the Cogeneration Facility. The new DSI on each unit will provide additional HCl control to supplement existing HCl control provided by the existing limestone injection systems (into the furnace) on each unit and ensure compliance with the Boiler MACT HCl limit effective May 23, 2019. Each DSI system will include a sorbent storage silo with a bin vent filter, weigh/feed hoppers with bin vent filters, blowers, piping, and injection nozzles to inject sorbent into the exhaust ductwork prior to the existing baghouses. The storage silos and weigh/feed hoppers are insignificant sources excluded from permitting under 15A NCAC 2Q .0102(h)(5).**

APPLICABLE REGULATIONS TO THE PROPOSED MODIFICATION (attach additional sheets if necessary)

Emission Source	ID No.	Applicable Standard	Applicable Requirement	Proposed Monitoring, Recordkeeping, and Reporting
Boiler No.6	ES-001	Boiler MACT	Maximum 0.022 lb/MMBtu HCl	As specified in 40 CFR 63, Subpart DDDDD
Boiler No.7	ES-002	Boiler MACT	Maximum 0.022 lb/MMBtu HCl	As specified in 40 CFR 63, Subpart DDDDD

ATTACH A COPY OF THE PROPOSED PERMIT CONDITIONS FOR EACH REQUIREMENT THAT APPLIES TO THE PERMIT MODIFICATION.

SPECIFIC PERMIT TERMS AND PROVISIONS AFFECTED BY THIS MODIFICATION (attach additonal sheets if necessary)

Source & ID No.	Permit Condition	Specify Provisions Which No Longer Apply
Boiler No.6 ES-001	2.1A.4.	15A NCAC 2D .1109 case-by-case Boiler MACT (no longer applicable after May 22, 2019)
Boiler No.7 ES-002	2.1A.4.	15A NCAC 2D .1109 case-by-case Boiler MACT (no longer applicable after May 22, 2019)

Upon receipt of the completeness determination letter, you may make the modification in accordance with 15A NCAC 2Q .0515(f). A determination of application completeness by the DAQ is not a determination that each change qualifies as a minor permit modification. It is the responsibility of the applicant to ensure each proposed change meets the criteria of 15A NCAC 2Q .0515. The applicant assumes all financial risks associated with construction and operation without a permit revision. You shall comply with both the applicable requirements governing the change and the proposed permit conditions until final action is taken on the permit application. You need not comply with the existing permit terms and conditions you seek to modify. However, if you fail to comply with the proposed monitoring, the Director may enforce the terms and conditions of the existing permit that you seek to modify. You must certify compliance with the proposed permit terms on the annual compliance certification. The permit shield in 15A NCAC 2Q .0512(a) does not extend to this modification.

15A NCAC 02Q .0515 Minor Permit Modifications

15A NCAC 02Q .0515(b)(3) Applicant's Suggested Draft Permit

The suggested permit condition language to require compliance with the Boiler MACT is presented in the Section VII. of the introductory narrative of this application. These standard permit conditions were provided to the University by the Division of Air Quality.

FORMs A2, A3, A4

EMISSION SOURCE LISTING FOR THIS APPLICATION - A2

112r APPLICABILITY INFORMATION - A3

SURVEY OF FACILITY REDUCTION & RECYCLING ACTIVITIES - A4

REVISED 12/01/01 — NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate — **A2**

EMISSION SOURCE LISTING: New, Modified, Previously Unpermitted, Replaced, Deleted

EMISSION SOURCE ID NO.	EMISSION SOURCE DESCRIPTION	CONTROL DEVICE ID NO.	CONTROL DEVICE DESCRIPTION
Equipment To Be ADDED By This Application (New, Previously Unpermitted, or Replacement)			
see below	*see below*	**CD-004.3**	**Dry Sorbent [$Ca(OH)_2$] Injection System**
see below	*see below*	**CD-005.3**	**Dry Sorbent [$Ca(OH)_2$] Injection System**
(New dry sorbent injection systems to be installed on existing Boilers B6 and B7 exhaust ducts)			
Existing Permitted Equipment To Be MODIFIED By This Application			
A. Existing equipment modified by addition of new dry sorbent injection systems.			
ES-001	Boiler #6 at Cogeneration Facility	CDs-004.1, 004.2	CaCO3 Injection; Bag Filter (no change)
ES-002	Boiler #7 at Cogeneration Facility	CDs-005.1, 005.2	CaCO3 Injection; Bag Filter (no change)
B. Replace current 112(j) case-by case MACT provisions with federal Boiler MACT provisions for six (6) existing boilers.			
ES-001	Boiler #6 at Cogeneration Facility		
ES-002	Boiler #7 at Cogeneration Facility		
ES-003	Boiler #8 at Cogeneration Facility		
ES-004	Boiler #9 at Manning Drive Steam Plant		
ES-005	Boiler #10 at Manning Drive Steam Plant		
ES-SB-6	Small Boiler at Davie Hall		
Equipment To Be DELETED By This Application			
	None		

112(r) APPLICABILITY INFORMATION — A 3

Is your facility subject to 40 CFR Part 68 "Prevention of Accidental Releases" - Section 112(r) of the Federal Clean Air Act? Yes / No **NO**

If No, please specify in detail how your facility avoided applicability: **No 112(r) hazardous or flammable materials stored in quantities above applicable thresholds.**

If your facility is Subject to 112(r), please complete the following: **NA**

A. Have you already submitted a Risk Management Plan (RMP) to EPA Pursuant to 40 CFR Part 68.10 or Part 68.150?

Yes No Specify required RMP submittal date: _____ If submitted, RMP submittal date: _____

B. Are you using administrative controls to subject your facility to a lesser 112(r) program standard?

Yes No If yes, please specify: _____

SURVEY OF FACILITY REDUCTION & RECYCLING ACTIVITIES — A 4

Facility Name: **The University of North Carolina at Chapel Hill**

Mailing Address Line 1: **1120 Estes Drive**

City: **Chapel Hill** State: **North Carolina** Zip Code: **27599-1650** County: **Orange**

Phone No. **(919) 962-6666** Fax No. **(919) 962-0227** Email Address: jldaw@ehs.unc.edu

Pollutant	Ongoing Source Reduction Activities (Enter Code)	Qty. Emitted Before Reduction (lb/yr)	Qty. Emitted After Reduction (lb/yr)	Planned Source Reduction Activities (Enter Code)
No facility reduction or recycling activities implemented with this permit application.				

For assistance with Section A4, please contact the North Carolina Division of Pollution Prevention and Environmental Assistance at 1-800-763-0136 or nowaste@p2pays.org

Attach Additional Sheets As Necessary

The University of North Carolina at Chapel Hill
Chapel Hill, North Carolina
Orange County

Boiler Nos. 6 & 7 Forms

A. New Equipment Required to Implement Boiler MACT By May 23, 2019

1. Two (2) Dry Sorbent Injection (DSI) Systems (Both Boiler Exhausts).
2. Two (2) sorbent [$Ca(OH)_2$] storage silos with bin vent filters (insignificant sources).
3. PM CEMS on each boiler exhaust.

B. Regulatory Changes to Implement Boiler MACT Requirements By May 23, 2019.

1. New Emission Limits

Boiler	MACT Status	Fuel Classification	Emission Limits, lb/MMBtu (CO-ppm[1])				
			Fil.PM	TSM	HCl	HG	CO
No.6 & 7	Existing	Coal	0.04	5.3E-05	0.022	5.7E-06	130[1]
		No.2 Oil	0.0079	6.2E-05	0.0011	2.0E-06	130[1]
		N. Gas	-	-	-	-	-
		Biomass	0.11	1.2E-03	0.022	5.7E-06	470[1]

2. Initial Performance Test within 180-days of May 23, 2019

3. Work Practice Standards

1. Boiler tuneup every 5-years and a one-time energy assessment
2. Operate all CMS during startup
3. Startup boiler on n.gas or distillate oil
4. Start sorbent injection/baghouse operation as expeditiously as possible when initiating coal/biomass combustion.
5. Operate all CMS during shutdown
6. Provide reports of activities during startup and shutdown

4. Operating Limits

1. Install PM CEMS/CPMS. Correlation for PM CMS from initial performance test.
2. Maintain minimum 1-run coal:sorbent injection rate(s) from 3-run performance test.
3. Minimum O_2 trim level set during performance test , if no CO CEMs installed
4. Limit firing rate to 110% of load during performance test

5. Continuous Compliance Monitoring

1. PM CEMS required for particulate limit.
2. Sorbent injection rate CPMS(s) for HCl and Hg limits.
3. O_2 analyzer CPMS for CO limits

6. Reporting and Plan Requirements

1. Initial notification.
2. Performance test reports.
3. Compliance status reports.
4. Site-specific monitoring plan.
5. Startup, shutdown, malfunction plan
6. Semiannual compliance reports

FORM B

SPECIFIC EMISSIONS SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 12/01/01 — NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate — **B**

EMISSION SOURCE DESCRIPTION: **2-identical existing 323.17 MMBtu/hr coal, natural gas, No. 2 oil, wood fired fluidized-bed boilers**	EMISSION SOURCE ID NO: **ES-001, ES-002**
OPERATING SCENARIO **All** OF **4**	CONTROL DEVICE ID NO(S): **CD-004.1-3 & CD-005.1-3**
	EMISSION POINT (STACK) ID NO(S): **EP 14-136**

DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Identical Boilers #6 and #7 are currently permitted to burn coal, No.2 fuel oil, natural gas, and wood-based fuels. The purpose of this application is to add a Dry Sorbent Injection (DSI) System to each boiler exhaust for supplemental HCl control and to incorporate federal Boiler MACT provisions into the Title V air permit. Boiler MACT regulated pollutant emissions presented on this form are for the worse-case 100% coal firing in one boiler. See Introduction for more details.

TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES):

- [X] Coal,wood,oil, gas, other burner (Form B1)
- [ ] Int.combustion engine/generator (Form B2)
- [ ] Liquid storage tanks (Form B3)
- [ ] Woodworking (Form B4)
- [ ] Coating/finishing/printing (Form B5)
- [ ] Storage silos/bins (Form B6)
- [ ] Manufact. of chemicals/coatings/inks (Form B7)
- [ ] Incineration (Form B8)
- [ ] Other (Form B9)

START CONSTRUCTION DATE: **Existing**	OPERATION DATE: **2/91**	DATE MANUFACTURED: **NA**
MANUFACTURER / MODEL NO.: **Pyropower**		EXPECTED OP. SCHEDULE: **24** HR/DAY **7** DAY/WK **52** WK/YR
IS THIS SOURCE SUBJECT TO? NSPS (SUBPART?): **Db**	NESHAP (SUBPART?): **NA**	MACT (SUBPART?): **DDDDD**
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB **25**	MAR-MAY **25**	JUN-AUG **25** SEP-NOV **25**
EXPECTED ANNUAL HOURS OF OPERATION **7000**	VISIBLE STACK EMISSIONS UNDER NORMAL OPERATION: **<10%** % OPACITY	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMSSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMSSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMSSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMSSIONS (AFTER CONTROLS / LIMITS) tons/yr
PARTICULATE MATTER (PM)							
PARTICULATE MATTER<10 MICRONS (PM_{10})							
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)							
SULFUR DIOXIDE (SO2)	***Only pollutant emission rates changed with this application are Filterable PM and HCl***						
NITROGEN OXIDES (NOx)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD	***Emission rates for 1 boiler***						
OTHER **Filterable PM**	**P. Tests**	**2.14**	**7.49**	**1069.6**	**4685.0**	**2.14**	**9.37**

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT AND CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMSSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMSSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMSSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMSSIONS (AFTER CONTROLS / LIMITS) tons/yr
	Only pollutant emission rates changed with this application are Filterable PM and HCl						
	Emission rates for 1 boiler						
Hydrogen Chloride (HCl)	**MACT Limit**	**7.11**	**24.88**	**NA**	**NA**	**7.11**	**31.14**

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

INDICATE EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS

TOXIC AIR POLLUTANT AND CAS NO.	EF SOURCE	lb/hr		lb/day		lb/yr	
Only pollutant emission rates changed with this application are Filterable PM and HCl							

COMPLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH SOURCE

Attach Additional Sheets As Necessary

FORM B1

EMISSION SOURCE (WOOD, COAL, OIL, GAS, OTHER FUEL-FIRED BURNER)

REVISED 12/01/01 — NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate — **B1**

EMISSION SOURCE DESCRIPTION: **Existing Boilers #6 and #7**	EMISSION SOURCE ID NO: **ES-001, ES-002**
	CONTROL DEVICE ID NO(S): **CD-004.1-3 & CD-005.1-3**
OPERATING SCENARIO: **4** OF **4**	EMISSION POINT (STACK) ID NO: **EP 14-136**

DESCRIBE USE: PROCESS HEAT — X SPACE HEAT — X ELECTRICAL GENERATION — X CONTINUOUS USE — STAND BY/EMERGENCY — X OTHER (DESCRIBE): **Steam**

HEATING MECHANISM: X INDIRECT — DIRECT

MAX. FIRING RATE (MMBTU/HOUI **Each Boiler has a capacity of 323.17 MMBTU/hr**

WOOD-FIRED BURNER

WOOD TYPE: BARK — WOOD/BARK — WET WOOD — DRY WOOD — X Other (Describe): **Wood Pellets**

PERCENT MOISTURE OF FUEL: _____

UNCONTROLLED — CONTROLLED WITH FLYASH REINJECTION — X CONTROLLED: **Limestone/Lime Injection& Baghouses**

FUEL FEED METHOD: **Circulating Fluidized-Bed** — HEAT TRANSFER MEDIA: X STEAM — AIR — OTHER

METHOD OF TUBE CLEANING: **Tube Blowing** — CLEANING SCHEDULE: **Every 8 hours**

COAL-FIRED BURNER

TYPE OF BOILER — IF OTHER DESCRIBE: **Circulating Fluidized-Bed**

PULVERIZED	OVERFEED STOKER	UNDERFEED STOKER	SPREADER STOKER	FLUIDIZED BED
☐ WET BED	UNCONTROLLED	UNCONTROLLED	UNCONTROLLED	X CIRCULATING
☐ DRY BED	CONTROLLED	CONTROLLED	FLYASH REINJECTION	RECIRCULATING
			NO FLYASH REINJECTION	

METHOD OF LOADING: CYCLONE — HANDFIRED — TRAVELING GRATE — OTHER (DESCRIBE): **Auger to Fluidized-Bed**

METHOD OF TUBE CLEANING: **Tube Blowing** — CLEANING SCHEDULE: **Every 8 hours**

OIL/GAS-FIRED BURNER

TYPE OF BOILER: ☐ UTILITY ☐ INDUSTRIAL ☐ COMMERCIAL ☐ RESIDENTIAL **Institutional**

TYPE OF FIRING: ☐ NORMAL ☐ TANGENTIAL ☐ LOW NOX BURNERS ☐ NO LOW NOX BURNER

METHOD OF TUBE CLEANING: **Tube Blowing** — CLEANING SCHEDULE: **Every 8 hours**

OTHER FUEL-FIRED BURNER

TYPE OF FUEL: _____ PERCENT MOISTURE: _____

TYPE OF BOILER: ☐ UTILITY ☐ INDUSTRIAL ☐ COMMERCIAL ☐ RESIDENTIAL

TYPE OF FIRING: _____ TYPE OF CONTROL (IF ANY): _____ FUEL FEED METHOD: _____

METHOD OF TUBE CLEANING: _____ CLEANING SCHEDULE: _____

FUEL USAGE (INCLUDE STARTUP/BACKUP FUELS)

FUEL TYPE	UNITS	MAXIMUM DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION (UNIT/HR)
Coal	tons	12.93	NA
Wood	tons	4.04 (20% of max. heat input)	NA
Natural Gas	cu ft.	313,757	
No.2 Fuel Oil	gallons	2,308	

FUEL CHARACTERISTICS (COMPLETE ALL THAT ARE APPLICABLE)

FUEL TYPE	SPECIFIC BTU CONTENT	SULFUR CONTENT (% BY WEIGHT)	ASH CONTENT (% BY WEIGHT)
Wood Pellets(co-fired with coal)	8,000 Btu/lb	Wood	Wood
Coal	12,500 Btu/lb	1.0-2.0	8-10
Commercially available No.2 oil and Natural gas			

SAMPLING PORTS, COMPLIANT WITH EPA METHOD 1 WILL BE INSTALLED ON THE STACKS: X YES — NO

COMMENTS: **These Boilers have NOx, SO_2, CO_2 CEMS and Opacity COMs systems in place.**
These Boilers also have limestone injection (furnace) and O_2 analyzer systems in place.

Attach Additional Sheets As Necessary

FORM C9

CONTROL DEVICE (OTHER)

REVISED 12/01/01 — NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate — C9

CONTROL DEVICE ID NO: CD-004.3, 005.3	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S): ES-001, 002
EMISSION POINT (STACK) ID NO(S): EP 14-136	POSITION IN SERIES OF CONTROLS: NO. 2 OF 3 UNITS
MANUFACTURER: TBD	MODEL NO: TBD
DATE MANUFACTURED: TBD	PROPOSED OPERATION DATE: May 23, 2019
OPERATING SCENARIO: Coal and Wood Firing	PROPOSED START CONSTRUCTION DATE: June/July 2018
	P.E. SEAL REQUIRED (PER 2Q .0112)? X YES NO

DESCRIBE CONTROL SYSTEM:

Boiler Nos. 6 and 7 are identical circulating fluidized-bed units currently equipped with calcium carbonate (limestone) injection into the boiler furnaces for acid gas control (primarily SO_2 and HCl) and baghouses for PM control. With this application, the University is proposing to add a hydrated lime [$Ca(OH)_2$} dry sorbent injection system (DSI) on each boiler for additional HCl control to supplement the existing limestone injection systems and assure compliance with the Boiler MACT HCl limit. Each DSI (2 units) will include a lime storage silo, weigh/feed hoppers, and blowers for lime injection into the exhaust ductwork prior to the baghouses. The silos and weigh hoppers may be equipped with bin vent filters, but are insignificant sources excluded from parmitting under 15A NCAC 2Q .0102(h)(5).

POLLUTANT(S) COLLECTED:	HCl						
BEFORE CONTROL EMISSION RATE (LB/HR):	53.2						
CAPTURE EFFICIENCY:	100	%		%		%		%
CONTROL DEVICE EFFICIENCY:	86.63%	%	Max. necessary with high chlorine content coal				
CORRESPONDING OVERALL EFFICIENCY:	86.63%	%	To achieve Boiler MACT limit 0.022 lb/MMBtu				
EFFICIENCY DETERMINATION CODE:	NA		Mass balance calculation				
TOTAL EMISSION RATE (LB/HR):	7.11		Max. with high chlorine content coal				

PRESSURE DROP (IN. H_2O):	MIN	TBD	MAX	TBD	BULK PARTICLE DENSITY (LB/FT^3)	TBD	
INLET TEMPERATURE (°F):	MIN	TBD	MAX	TBD	OUTLET TEMPERATURE (°F): MIN	TBD	MAX TBD
INLET AIR FLOW RATE (ACFM):		TBD			OUTLET AIR FLOW RATE (ACFM):	TBD	
INLET AIR FLOW VELOCITY (FT/SEC):		TBD			OUTLET AIR FLOW VELOCITY (FT/SEC):	TBD	
INLET MOISTURE CONTENT (%):		TBD			X FORCED AIR / INDUCED AIR	NA	
COLLECTION SURFACE AREA (FT^2):		NA			FUEL USED: NA	FUEL USAGE RATE: NA	

DESCRIBE STARTUP PROCEDURES:

DSI operation begun concurrent with firing coal or wood-based fuel

DESCRIBE MAINTENANCE PROCEDURES:

TBD

DESCRIBE ANY AUXILIARY MATERIALS INTRODUCED INTO THE CONTROL SYSTEM:

Hydrated lime [$Ca(OH)_2$]

DESCRIBE ANY MONITORING DEVICES, GAUGES, TEST PORTS, ETC:

Lime injection rate CPMS (lb of coal/wood to lb of lime ratio)

ATTACH A DIAGRAM OF THE RELATIONSHIP OF THE CONTROL DEVICE TO ITS EMISSION SOURCE(S):

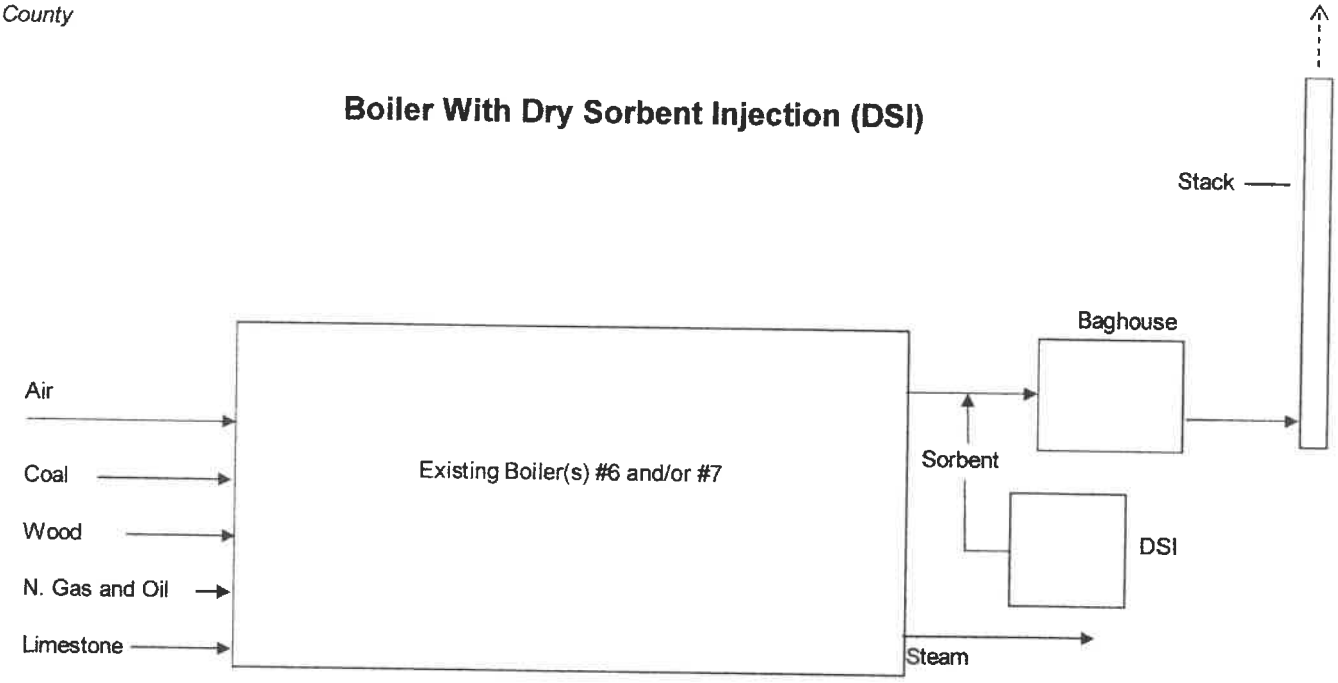
Attached

Attach manufacturer's specifications, schematics, and all other drawings necessary to describe this control.

Attach Additional Sheets As Necessary

The University of North Carolina at Chapel Hill
Chapel Hill, North Carolina
Orange County

Boiler With Dry Sorbent Injection (DSI)



Flow Diagram

FORM E3

EMISSION SOURCE COMPLIANCE METHOD

REVISED 12/01/01 — NCDENR/Division Of Air Quality - Application for Air Permit to Construct/Operate — E3

Emission Source ID NO. **ES-001, ES-002**	Regulated Pollutant	**Filterable PM**
	Applicable Regulation	**40 CFR 63, Subpart DDDDD**
Alternative Operating Scenario (AOS) NO: **1 & 4 (coal & wood)**		**Boiler MACT**

ATTACH A SEPARATE PAGE TO EXPAND ON ANY OF THE BELOW COMMENTS

MONITORING REQUIREMENTS

Is Compliance Assurance Monitoring (CAM) 40 CFR Part 64 Applicable? Yes X No

If yes, is CAM Plan Attached (if applicable, CAM plan must be attached)? Yes NA No

Describe Monitoring Device Type: **PM CEMs**

Describe Monitoring Location: **Exhaust Breeching Prior to Common Stack**

Other Monitoring Methods (Describe In Detail): **Annual Boiler MACT performance test**

Boiler Tuneup every 5-years

Describe the frequency and duration of monitoring and how the data will be recorded (i.e., every 15 minutes, 1 minute instantaneous readings taken to produce an hourly average):

PM CEMs - Filterable PM Concentrations Every 15 Minutes

RECORDKEEPING REQUIREMENTS

Data (Parameter) being recording: **lb/MMBtu, Filterable PM Emission Rate**

Frequency of recordkeeping (How often is data recorded?): **Continuously**

REPORTING REQUIREMENTS

Generally describe what is being reported:

Semiannual Emissions Report including PM CEMs data

Downtime and Excess Emissions. Fuel records semi-annually.

Frequency: MONTHLY QUARTERLY X EVERY 6 MONTHS

X OTHER (DESCRIBE): **Annual Emissions/Compliance Certification**

TESTING

Specify proposed reference test method: **Annual Performance Tests and PM CEMS RATAs**

Specify reference test method rule and citation: **Methods 5**

Specify testing frequency: **Annual**

NOTE - Proposed test method subject to approval and possible change during the test protocol process

Attach Additional Sheets As Necessary

FORM E3

EMISSION SOURCE COMPLIANCE METHOD

REVISED 12/01/01 — NCDENR/Division Of Air Quality - Application for Air Permit to Construct/Operate — E3

Emission Source ID NO. **ES-001, ES-002**	Regulated Pollutant **HCl & Hg**
Alternative Operating Scenario (AOS) NO: **1 & 4 (coal & wood)**	Applicable Regulation **40 CFR 63, Subpart DDDDD Boiler MACT**

ATTACH A SEPARATE PAGE TO EXPAND ON ANY OF THE BELOW COMMENTS

MONITORING REQUIREMENTS

Is Compliance Assurance Monitoring (CAM) 40 CFR Part 64 Applicable? Yes X No

If yes, is CAM Plan Attached (if applicable, CAM plan must be attached)? Yes NA No

Describe Monitoring Device Type: **Hydrated Lime Injection CPMS**

Describe Monitoring Location: **Coal/Wood Feed Weigh Belt and DSI Feed Weigh Hopper**

Other Monitoring Methods (Describe In Detail): **Coal/Wood to Lime Ratio Operating Limit Established for HCl and Mercury Control During Performance Test(s)**

Boiler Tuneup every 5-years

Describe the frequency and duration of monitoring and how the data will be recorded (i.e., every 15 minutes, 1 minute instantaneous readings taken to produce an hourly average):

Concurrent Coal/Wood and Lime Feed Rates Every 15 Minutes

RECORDKEEPING REQUIREMENTS

Data (Parameter) being recording: **Lbs of Coal/Wood and Lbs of Hydrated Lime**

Frequency of recordkeeping (How often is data recorded?): **Continuously**

REPORTING REQUIREMENTS

Generally describe what is being reported:

Semiannual Emissions Report including CPMS data

Downtime and Excess Emissions. Fuel records semi-annually.

Frequency: MONTHLY QUARTERLY X EVERY 6 MONTHS

X OTHER (DESCRIBE): **Annual Emissions/Compliance Certification**

TESTING

Specify proposed reference test method: **Annual Performance Tests and CPMS Calibration**

Specify reference test method rule and citation: **Methods 26A and 30B**

Specify testing frequency: **Annual**

NOTE - Proposed test method subject to approval and possible change during the test protocol process

Attach Additional Sheets As Necessary

FORM E3

EMISSION SOURCE COMPLIANCE METHOD

REVISED 12/01/01 | NCDENR/Division Of Air Quality - Application for Air Permit to Construct/Operate | E3

Emission Source ID NO. **ES-001, ES-002**	Regulated Pollutant	**Carbon Monoxide (CO)**
	Applicable Regulation	**40 CFR 63, Subpart DDDDD**
Alternative Operating Scenario (AOS) NO: **1- 4**		**Boiler MACT**

ATTACH A SEPARATE PAGE TO EXPAND ON ANY OF THE BELOW COMMENTS

MONITORING REQUIREMENTS

Is Compliance Assurance Monitoring (CAM) 40 CFR Part 64 Applicable? Yes X No

If yes, is CAM Plan Attached (if applicable, CAM plan must be attached)? Yes NA No

Describe Monitoring Device Type: **Oxygen (O_2) Analyzer CPMS - Surrogate monitoring option for CO**

Describe Monitoring Location: **Boiler Furnace Outlet**

Other Monitoring Methods (Describe In Detail): **Annual Boiler MACT performance test**

Boiler Tuneup every 5-years

Describe the frequency and duration of monitoring and how the data will be recorded (i.e., every 15 minutes, 1 minute instantaneous readings taken to produce an hourly average):

O_2 concentrations recorded every 15-minutes

15-min. O_2 concentrations coverted to hourly and 30-day average concentrations by DAHS

30-day everage operating limit to be set during CO performance tests

RECORDKEEPING REQUIREMENTS

Data (Parameter) being recording: **O_2 concentration**

Frequency of recordkeeping (How often is data recorded?): **Hourly**

REPORTING REQUIREMENTS

Generally describe what is being reported:

Semiannual Compliance Monitoring Report including O_2 concentration data

O_2 CPMS Downtime and Excess Emissions

Fuel records semiannually.

Frequency: MONTHLY QUARTERLY X EVERY 6 MONTHS

X OTHER (DESCRIBE): **Annual Emissions/Compliance Certification**

TESTING

Specify proposed reference test method: **Annual performance tests for CO**

Specify reference test method rule and citation: **Methods 3A and 10**

Specify testing frequency: **Annually for 3-yrs, every 3rd year after 1st 3-years**

NOTE - Proposed test method subject to approval and possible change during the test protocol process

Attach Additional Sheets As Necessary

The University of North Carolina at Chapel Hill
Chapel Hill, North Carolina
Orange County

Boiler No. 8 Forms

A. New Equipment Required to Implement Boiler MACT By May 23, 2019
None

B. Regulatory Changes to Implement Boiler MACT Requirements Effective May 23, 2019.
(Not required for implementation prior to May 23, 2019)

1. New Emission Limits

Boiler	MACT Status	Fuel Classification	Emission Limits, lb/MMBtu (CO-ppm[1])				
			Fil.PM	TSM	HCl	HG	CO
No.8	Existing	No.2 Fuel Oil	0.0079	6.2E-05	0.0011	2.0E-06	130[1]
		Natural Gas	-	-	-	-	-

2. Initial Performance Test within 180-days of May 23, 2019

3. Work Practice Standards
1. Boiler tuneup every 5-years and a one-time energy assessment
2. Operate all CMS (O_2 analyzers) during startup
3. Operate all CMS (O_2 analyzers) during shutdown

4. Operating Limits
1. Minimum O_2 concentration level set during CO performance test , if no CO CEMs installed
2. Limit firing rate to 110% of load during performance test

5. Continuous Compliance Monitoring
1. O_2 analyzer CPMS for CO limits

6. Reporting and Plan Requirements
1. Initial notification.
2. Performance test reports.
3. Compliance status reports.
4. Site-specific monitoring plan.
5. Startup, shutdown, malfunction plan
6. Semiannual compliance reports

FORM B

SPECIFIC EMISSIONS SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 12/01/01 — NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate — **B**

EMISSION SOURCE DESCRIPTION: **338 MMBtu/hr Nat. Gas/No.2 Fuel Oil Fired Boiler**	EMISSION SOURCE ID NO: **ES-003**
OPERATING SCENARIO **2** OF **2**	CONTROL DEVICE ID NO(S): **NA**
	EMISSION POINT (STACK) ID NO(S): **EP-Stk 4**

DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

One 338 MMBtu/hr natural gas (primary) and No.2 oil (backup) fired boiler at the Cogeneration Facility. Unit is already permitted. No change in emissions with this application. All Boiler MACT changes for this boiler with this application are applicable regulatory changes, i.e. emission limits, work practice standards, operating limits, continuous compliance monitoring, reporting and plan document(s) (SSM plan, site-specific monitoring plan, etc.) requirements.

TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES):

- [X] Coal,wood,oil, gas, other burner (Form B1)
- [ ] Woodworking (Form B4)
- [ ] Manufact. of chemicals/coatings/inks (Form B7)
- [ ] Int.combustion engine/generator (Form B2)
- [ ] Coating/finishing/printing (Form B5)
- [ ] Incineration (Form B8)
- [ ] Liquid storage tanks (Form B3)
- [ ] Storage silos/bins (Form B6)
- [ ] Other (Form B9)

START CONSTRUCTION DATE: **Existing**	OPERATION DATE: **Existing**	DATE MANUFACTURED: **NA**
MANUFACTURER / MODEL NO.:	EXPECTED OP. SCHEDULE: **NA** HR/DAY **NA** DAY/WK **NA** WK/YR	
IS THIS SOURCE SUBJECT TO? NSPS (SUBPART?): **Subpart Db**	NESHAP (SUBPART?): **No**	MACT (SUBPART?): **No**
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB **25**	MAR-MAY **25**	JUN-AUG **25** SEP-NOV **25**
EXPECTED ANNUAL HOURS OF OPERATION **NA**	VISIBLE STACK EMISSIONS UNDER NORMAL OPERATION: **<10** % OPACITY	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMSSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMSSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMSSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMSSIONS (AFTER CONTROLS / LIMITS) tons/yr
PARTICULATE MATTER (PM)							
PARTICULATE MATTER<10 MICRONS (PM_{10})							
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)							
SULFUR DIOXIDE (SO2)	***No pollutant emission rates changed with this application***						
NITROGEN OXIDES (NOx)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT AND CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMSSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMSSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMSSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMSSIONS (AFTER CONTROLS / LIMITS) tons/yr
	No pollutant emission rates changed with this application						

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

INDICATE EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS

TOXIC AIR POLLUTANT AND CAS NO.	EF SOURCE	lb/hr	lb/day	lb/yr
	No pollutant emission rates changed with this application			

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) de

COMPLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH SOURCE

Attach Additional Sheets As Necessary

FORM B1

EMISSION SOURCE (WOOD, COAL, OIL, GAS, OTHER FUEL-FIRED BURNER)

REVISED 12/01/01 — NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate — **B1**

EMISSION SOURCE DESCRIPTION: **338 MMBtu/hr Boiler**	EMISSION SOURCE ID NO: **ES-003**
	CONTROL DEVICE ID NO(S): **NA**
OPERATING SCENARIO: **2** OF **2**	EMISSION POINT (STACK) ID NO(S): **EP-Stk 4**

DESCRIBE USE: PROCESS HEAT | SPACE HEAT | ELECTRICAL GENERATION
CONTINUOUS USE | **X** STAND BY/EMERGENCY | OTHER (DESCRIBE): _____

HEATING MECHANISM: **X** INDIRECT | DIRECT

MAX. FIRING RATE (MMBTU/HOUR): **338**

WOOD-FIRED BURNER

WOOD TYPE: BARK | WOOD/BARK | WET WOOD | DRY WOOD | OTHER (DESCRIBE): _____

PERCENT MOISTURE OF FUEL: _____

UNCONTROLLED | CONTROLLED WITH FLYASH REINJECTION | CONTROLLED W/O REINJECTION

FUEL FEED METHOD: | HEAT TRANSFER MEDIA: STEAM AIR OTHER

METHOD OF TUBE CLEANING: | CLEANING SCHEDULE:

COAL-FIRED BURNER

TYPE OF BOILER | IF OTHER DESCRIBE:

PULVERIZED	OVERFEED STOKER	UNDERFEED STOKER	SPREADER STOKER	FLUIDIZED BED
☐ WET BED	UNCONTROLLED	UNCONTROLLED	UNCONTROLLED	CIRCULATING
☐ DRY BED	CONTROLLED	CONTROLLED	FLYASH REINJECTION	RECIRCULATING
			NO FLYASH REINJECTION	

METHOD OF LOADING: CYCLONE | HANDFIRED | TRAVELING GRATE | OTHER (DESCRIBE): _____

METHOD OF TUBE CLEANING: | CLEANING SCHEDULE:

OIL/GAS-FIRED BURNER

TYPE OF BOILER: ☐ UTILITY c INDUSTRIAL ☐ COMMERCIAL ☐ RESIDENTIAL **X Institutional**

TYPE OF FIRING: ☐ NORMAL ☐ TANGENTIAL **X** LOW NOX BURNERS ☐ NO LOW NOX BURNER **LNB/FGR**

METHOD OF TUBE CLEANING: **NA** CLEANING SCHEDULE: **NA**

OTHER FUEL-FIRED BURNER

TYPE OF FUEL: _____ PERCENT MOISTURE: _____

TYPE OF BOILER: ☐ UTILITY ☐ INDUSTRIAL ☐ COMMERCIAL ☐ RESIDENTIAL

TYPE OF FIRING: _____ TYPE OF CONTROL (IF ANY): _____ FUEL FEED METHOD: _____

METHOD OF TUBE CLEANING: CLEANING SCHEDULE:

FUEL USAGE (INCLUDE STARTUP/BACKUP FUELS)

FUEL TYPE	UNITS	MAXIMUM DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION (UNIT/HR)
Natural Gas	**cu. ft.**	**328,155 cu.ft. based on 1030 Btu/cu.ft.**	**None**
No.2 Fuel Oil	**gallons**	**2,414 gal/hr based on 140,000 Btu/gal**	**None**

FUEL CHARACTERISTICS (COMPLETE ALL THAT ARE APPLICABLE)

FUEL TYPE	SPECIFIC BTU CONTENT	SULFUR CONTENT (% BY WEIGHT)	ASH CONTENT (% BY WEIGHT)
Natural Gas	**Max. 1030 Btu/cu.ft.**	**NA**	**NA**
No.2 Fuel Oil	**Max. 142,000 Btu/gal**	**0.3**	**NA**

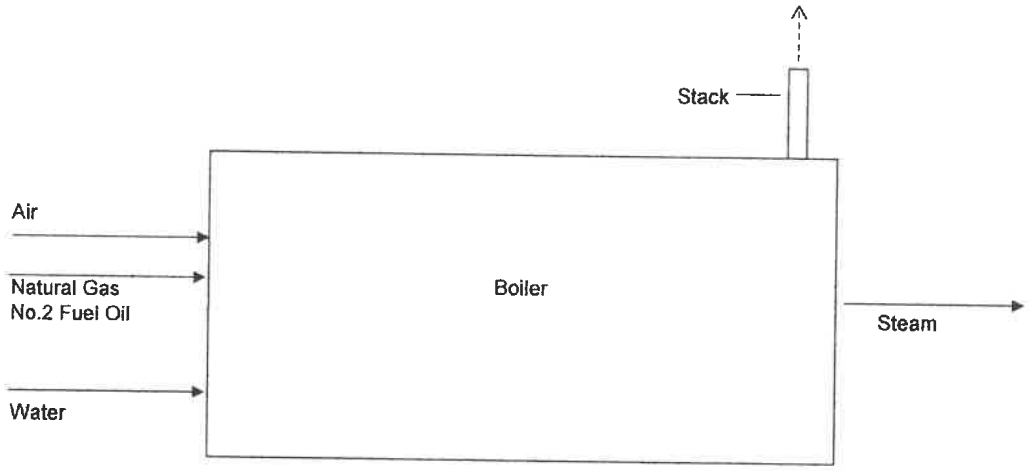
SAMPLING PORTS, COMPLIANT WITH EPA METHOD 1 WILL BE INSTALLED ON THE STACKS: **X** YES NO

COMMENTS:

Attach Additional Sheets As Necessary

The University of North Carolina at Chapel Hill
Chapel Hill, North Carolina
Orange County

338 MMBtu/hr Natural Gas/No.2 Fuel Oil-Fired Boiler



Flow Diagram

FORM E3

EMISSION SOURCE COMPLIANCE METHOD

REVISED 12/01/01 | **NCDENR/Division Of Air Quality - Application for Air Permit to Construct/Operate** | **E3**

Emission Source ID NO. **ES-003** | Regulated Pollutant **Filterable PM, HCl, & Hg**

Alternative Operating Scenario (AOS) NO: **No.2 Oil** | Applicable Regulation **40 CFR 63, Subpart DDDDD Boiler MACT**

ATTACH A SEPARATE PAGE TO EXPAND ON ANY OF THE BELOW COMMENTS

MONITORING REQUIREMENTS

Is Compliance Assurance Monitoring (CAM) 40 CFR Part 64 Applicable? __ Yes X No

If yes, is CAM Plan Attached (if applicable, CAM plan must be attached)? NA Yes NA No

Describe Monitoring Device Type: **None**

Describe Monitoring Location: **None**

Other Monitoring Methods (Describe In Detail): **Annual Boiler MACT performance test when burning No.2 oil (no emission limits with natural gas) Boiler Tuneup every 5-years**

Describe the frequency and duration of monitoring and how the data will be recorded (i.e., every 15 minutes, 1 minute instantaneous readings taken to produce an hourly average):

NA

RECORDKEEPING REQUIREMENTS

Data (Parameter) being recording: **Annual performance test reports & annual fuel use**

Frequency of recordkeeping (How often is data recorded?): **Recorded annually**

REPORTING REQUIREMENTS

Generally describe what is being reported: **Performance tests & annual fuel use**

Frequency: __ MONTHLY __ QUARTERLY __ EVERY 6 MONTHS

X OTHER (DESCRIBE): **Annually**

TESTING

Specify proposed reference test method: **Methods 5, 26A, and 30B**

Specify reference test method rule and citation: **40 CFR 60, Appendix A**

Specify testing frequency: **Annually**

NOTE - Proposed test method subject to approval and possible change during the test protocol process

Attach Additional Sheets As Necessary

FORM E3

EMISSION SOURCE COMPLIANCE METHOD

REVISED 12/01/01 | NCDENR/Division Of Air Quality - Application for Air Permit to Construct/Operate | E3

Emission Source ID NO. **ES-003**	Regulated Pollutant	**Carbon Monoxide (CO)**
	Applicable Regulation	**40 CFR 63, Subpart DDDDD**
Alternative Operating Scenario (AOS) NO: **No.2 Oil**		**Boiler MACT**

ATTACH A SEPARATE PAGE TO EXPAND ON ANY OF THE BELOW COMMENTS

MONITORING REQUIREMENTS

Is Compliance Assurance Monitoring (CAM) 40 CFR Part 64 Applicable? Yes X No

If yes, is CAM Plan Attached (if applicable, CAM plan must be attached)? Yes NA No

Describe Monitoring Device Type: **Oxygen (O_2) analyzer CPMS - Surrogate monitoring option for CO**

Describe Monitoring Location: **Boiler Furnace Outlet**

Other Monitoring Methods (Describe In Detail): **Annual Boiler MACT performance test when burning No.2 oil (no emission limits with natural gas)**

Boiler Tuneup every 5-years

Describe the frequency and duration of monitoring and how the data will be recorded (i.e., every 15 minutes, 1 minute instantaneous readings taken to produce an hourly average):

O_2 concentrations recorded every 15-minutes

15-min. O_2 concentrations coverted to hourly and 30-day average concentrations by DAHS

30-day everage operating limit to be set during CO performance tests

RECORDKEEPING REQUIREMENTS

Data (Parameter) being recording: **O_2 concentration**

Frequency of recordkeeping (How often is data recorded?): **Every 15 minutes**

REPORTING REQUIREMENTS

Generally describe what is being reported:

Semiannual Compliance Monitoring Report including O_2 concentration data

O_2 Analyzer CPMS Downtime and Excess Emissions

Fuel records semiannually.

Frequency: MONTHLY QUARTERLY X EVERY 6 MONTHS

X OTHER (DESCRIBE): **Annual Emissions/Compliance Certification**

TESTING

Specify proposed reference test method: **Annual performance tests for CO**

Specify reference test method rule and citation: **Methods 3A and 10**

Specify testing frequency: **Annually for 3-yrs, every 3rd year after 1st 3-years**

NOTE - Proposed test method subject to approval and possible change during the test protocol process

Attach Additional Sheets As Necessary

The University of North Carolina at Chapel Hill
Chapel Hill, North Carolina
Orange County

Boiler Nos. 9 & 10 Forms

A. New Equipment Required to Implement Boiler MACT By May 23, 2019
None

B. Regulatory Changes to Implement Boiler MACT Requirements Effective May 23, 2019.
(Not required for implementation prior to May 23, 2019)

1. New Emission Limits

Boiler	MACT Status	Fuel Classification	Emission Limits, lb/MMBtu (CO-ppm[1])				
			Fil.PM	TSM	HCl	HG	CO
Nos. 9&10	Existing	No.2 Fuel Oil	0.0079	6.2E-05	0.0011	2.0E-06	130[1]
		Natural Gas	-	-	-	-	-

2. Initial Performance Test within 180-days of May 23, 2019

3. Work Practice Standards
1.Boiler tuneup every 5-years and a one-time energy assessment
2.Operate all CMS (O_2 analyzers) during startup
3.Operate all CMS (O_2 analyzers) during shutdown

4. Operating Limits
1. Minimum O2 concentration level set during CO performance test , if no CO CEMs installed
2. Limit firing rate to 110% of load during performance test

5. Continuous Compliance Monitoring
1. O_2 analyzer CPMS for CO limits

6. Reporting and Plan Requirements
1. Initial notification.
2. Performance test reports.
3. Compliance status reports.
4. Site-specific monitoring plan.
5. Startup, shutdown, malfunction plan
6. Semiannual compliance reports

FORM B

SPECIFIC EMISSIONS SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 12/01/01 — NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate — **B**

EMISSION SOURCE DESCRIPTION: **2-249 MMBtu/hr Nat. Gas/No.2 Fuel Oil Fired Boilers**	EMISSION SOURCE ID NO: **ES-004, ES-005**
	CONTROL DEVICE ID NO(S): **NA**
OPERATING SCENARIO **2** OF **2**	EMISSION POINT (STACK) ID NO(S): **EP-9/10**

DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Two identical 249 MMBtu/hr natural gas (primary) and No.2 oil (backup) fired boiler at the Manning Drive Steam Plant. Units are already permitted. No change in emissions with this application. All Boiler MACT changes for these boilers with this application are applicable regulatory changes, i.e. emission limits, work practice standards, operating limits, continuous compliance monitoring, reporting and plan document(s) (SSM plan, site-specific monitoring plan, etc.) requirements.

TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES):

X Coal,wood,oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manufact. of chemicals/coatings/inks (Form B7)
☐ Int.combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☐ Other (Form B9)

START CONSTRUCTION DATE: **Existing**	OPERATION DATE: **Existing**	DATE MANUFACTURED: **NA**
MANUFACTURER / MODEL NO.:	EXPECTED OP. SCHEDULE: **NA** HR/DAY **NA** DAY/WK **NA** WK/YR	
IS THIS SOURCE SUBJECT TO? NSPS (SUBPART?): **Subpart Db**	NESHAP (SUBPART?): **No**	MACT (SUBPART?): **No**
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB **25**	MAR-MAY **25**	JUN-AUG **25** SEP-NOV **25**
EXPECTED ANNUAL HOURS OF OPERATION **NA**	VISIBLE STACK EMISSIONS UNDER NORMAL OPERATION: **<10** % OPACITY	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMSSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMSSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMSSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMSSIONS (AFTER CONTROLS / LIMITS) tons/yr
PARTICULATE MATTER (PM)							
PARTICULATE MATTER<10 MICRONS (PM_{10})							
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)							
SULFUR DIOXIDE (SO2)	***No pollutant emission rates changed with this application***						
NITROGEN OXIDES (NOx)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT AND CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMSSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMSSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMSSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMSSIONS (AFTER CONTROLS / LIMITS) tons/yr
	No pollutant emission rates changed with this application						

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

INDICATE EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS

TOXIC AIR POLLUTANT AND CAS NO.	EF SOURCE	lb/hr	lb/day	lb/yr
	No pollutant emission rates changed with this application			

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) de

COMPLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH SOURCE

Attach Additional Sheets As Necessary

FORM B1

EMISSION SOURCE (WOOD, COAL, OIL, GAS, OTHER FUEL-FIRED BURNER)

REVISED 12/01/01 — NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate — **B1**

EMISSION SOURCE DESCRIPTION: **2-249 MMBtu/hr Boilers** **Alternative Operating Scenario - No.2 Fuel Oil**	EMISSION SOURCE ID NO: **ES-004, ES-005**
	CONTROL DEVICE ID NO(S): **NA**
OPERATING SCENARIO: **2** OF **2**	EMISSION POINT (STACK) ID NO(S): **EP-9/10**

DESCRIBE USE: PROCESS HEAT SPACE HEAT ELECTRICAL GENERATION
CONTINUOUS USE **X** STAND BY/EMERGENCY OTHER (DESCRIBE): _____

HEATING MECHANISM: **X** INDIRECT DIRECT

MAX. FIRING RATE (MMBTU/HOUR): **249**

WOOD-FIRED BURNER

WOOD TYPE: BARK WOOD/BARK WET WOOD DRY WOOD OTHER (DESCRIBE): _____

PERCENT MOISTURE OF FUEL: _____

UNCONTROLLED CONTROLLED WITH FLYASH REINJECTION CONTROLLED W/O REINJECTION

FUEL FEED METHOD: HEAT TRANSFER MEDIA: STEAM AIR OTHER

METHOD OF TUBE CLEANING: CLEANING SCHEDULE:

COAL-FIRED BURNER

TYPE OF BOILER IF OTHER DESCRIBE:

PULVERIZED	OVERFEED STOKER	UNDERFEED STOKER	SPREADER STOKER	FLUIDIZED BED
☐ WET BED	UNCONTROLLED	UNCONTROLLED	UNCONTROLLED	CIRCULATING
☐ DRY BED	CONTROLLED	CONTROLLED	FLYASH REINJECTION	RECIRCULATING
			NO FLYASH REINJECTION	

METHOD OF LOADING: CYCLONE HANDFIRED TRAVELING GRATE OTHER (DESCRIBE): _____

METHOD OF TUBE CLEANING: CLEANING SCHEDULE:

OIL/GAS-FIRED BURNER

TYPE OF BOILER: ☐ UTILITY c INDUSTRIAL ☐ COMMERCIAL ☐ RESIDENTIAL **X Institutional**

TYPE OF FIRING: ☐ NORMAL ☐ TANGENTIAL **X** LOW NOX BURNERS ☐ NO LOW NOX BURNER **LNB/FGR**

METHOD OF TUBE CLEANING: **NA** CLEANING SCHEDULE: **NA**

OTHER FUEL-FIRED BURNER

TYPE OF FUEL: _____ PERCENT MOISTURE: _____

TYPE OF BOILER: ☐ UTILITY ☐ INDUSTRIAL ☐ COMMERCIAL ☐ RESIDENTIAL

TYPE OF FIRING: _____ TYPE OF CONTROL (IF ANY): _____ FUEL FEED METHOD: _____

METHOD OF TUBE CLEANING: CLEANING SCHEDULE:

FUEL USAGE (INCLUDE STARTUP/BACKUP FUELS)

FUEL TYPE	UNITS	MAXIMUM DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION (UNIT/HR)
Natural Gas	**cu. ft.**	**241,748 cu.ft. based on 1030 Btu/cu.ft.**	**None**
No.2 Fuel Oil	**gallons**	**1,779 gal/hr based on 140,000 Btu/gal**	**None**

FUEL CHARACTERISTICS (COMPLETE ALL THAT ARE APPLICABLE)

FUEL TYPE	SPECIFIC BTU CONTENT	SULFUR CONTENT (% BY WEIGHT)	ASH CONTENT (% BY WEIGHT)
Natural Gas	**Max. 1030 Btu/cu.ft.**	**NA**	**NA**
No.2 Fuel Oil	**Max. 142,000 Btu/gal**	**0.3**	**NA**

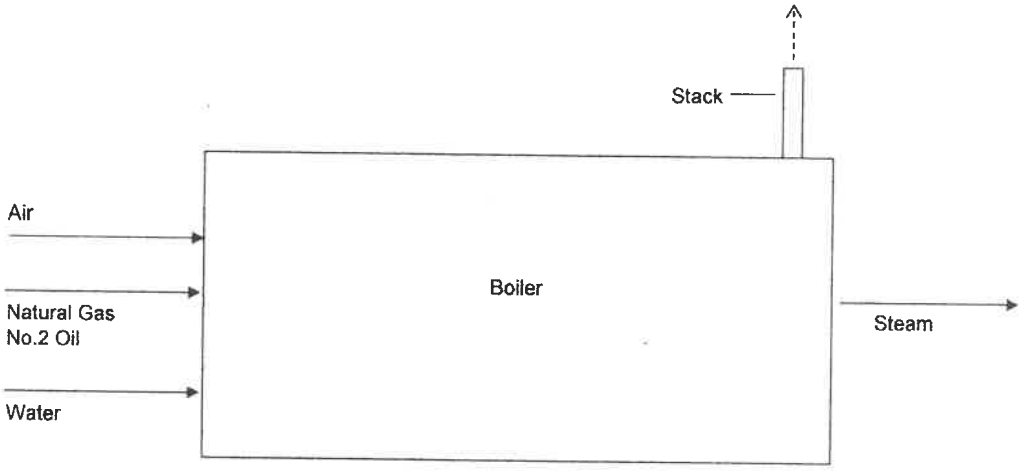
SAMPLING PORTS, COMPLIANT WITH EPA METHOD 1 WILL BE INSTALLED ON THE STACKS: **X** YES NO

COMMENTS:

Attach Additional Sheets As Necessary

The University of North Carolina at Chapel Hill
Chapel Hill, North Carolina
Orange County

249 MMBtu/hr Natural Gas/No.2 Fuel Oil-Fired Boiler



Flow Diagram

FORM E3

EMISSION SOURCE COMPLIANCE METHOD

REVISED 12/01/01 — NCDENR/Division Of Air Quality - Application for Air Permit to Construct/Operate — E3

Emission Source ID NO. **ES-004, ES-005**
Regulated Pollutant **Filterable PM, HCl, & Hg**
Applicable Regulation **40 CFR 63, Subpart DDDDD Boiler MACT**
Alternative Operating Scenario (AOS) NO: **No.2 Oil**

ATTACH A SEPARATE PAGE TO EXPAND ON ANY OF THE BELOW COMMENTS

MONITORING REQUIREMENTS

Is Compliance Assurance Monitoring (CAM) 40 CFR Part 64 Applicable? __ Yes X No
If yes, is CAM Plan Attached (if applicable, CAM plan must be attached)? NA Yes NA No
Describe Monitoring Device Type: **None**
Describe Monitoring Location: **None**
Other Monitoring Methods (Describe In Detail): **Annual Boiler MACT performance test when burning No.2 oil (no emission limits with natural gas) Boiler Tuneup every 5-years**

Describe the frequency and duration of monitoring and how the data will be recorded (i.e., every 15 minutes, 1 minute instantaneous readings taken to produce an hourly average):
None

RECORDKEEPING REQUIREMENTS

Data (Parameter) being recording: **Annual performance test reports & annual fuel use**
Frequency of recordkeeping (How often is data recorded?): **Recorded annually**

REPORTING REQUIREMENTS

Generally describe what is being reported: **Performance tests & annual fuel use**

Frequency: __ MONTHLY __ QUARTERLY __ EVERY 6 MONTHS
X OTHER (DESCRIBE): **Annually**

TESTING

Specify proposed reference test method: **Methods 5, 26A, and 30B**
Specify reference test method rule and citation: **40 CFR 60, Appendix A**
Specify testing frequency: **Annually**

NOTE - Proposed test method subject to approval and possible change during the test protocol process

Attach Additional Sheets As Necessary

FORM E3

EMISSION SOURCE COMPLIANCE METHOD

REVISED 12/01/01 | NCDENR/Division Of Air Quality - Application for Air Permit to Construct/Operate | E3

Emission Source ID NO. **ES-004, ES-005**	Regulated Pollutant	**Carbon Monoxide (CO)**
	Applicable Regulation	**40 CFR 63, Subpart DDDDD**
Alternative Operating Scenario (AOS) NO: **No.2 Oil**		**Boiler MACT**

ATTACH A SEPARATE PAGE TO EXPAND ON ANY OF THE BELOW COMMENTS

MONITORING REQUIREMENTS

Is Compliance Assurance Monitoring (CAM) 40 CFR Part 64 Applicable? Yes **X** No

If yes, is CAM Plan Attached (if applicable, CAM plan must be attached)? Yes **NA** No

Describe Monitoring Device Type: **Oxygen (O_2) analyzer CPMS - Surrogate monitoring option for CO**

Describe Monitoring Location: **Boiler Furnace Outlet**

Other Monitoring Methods (Describe In Detail): **Annual Boiler MACT performance test when burning No.2 oil (no emission limits with natural gas)**

Boiler Tuneup every 5-years

Describe the frequency and duration of monitoring and how the data will be recorded (i.e., every 15 minutes, 1 minute instantaneous readings taken to produce an hourly average):

O_2 concentrations recorded every 15-minutes

15-min. O_2 concentrations coverted to hourly and 30-day average concentrations by DAHS

30-day everage operating limit to be set during CO performance tests

RECORDKEEPING REQUIREMENTS

Data (Parameter) being recording: **O_2 concentration**

Frequency of recordkeeping (How often is data recorded?): **Every 15 minutes**

REPORTING REQUIREMENTS

Generally describe what is being reported:

Semiannual Compliance Monitoring Report including O_2 concentration data

O_2 Analyzer CPMS Downtime and Excess Emissions

Fuel records semiannually.

Frequency: MONTHLY QUARTERLY **X** EVERY 6 MONTHS

X OTHER (DESCRIBE): **Annual Emissions/Compliance Certification**

TESTING

Specify proposed reference test method: **Annual performance tests for CO**

Specify reference test method rule and citation: **Methods 3A and 10**

Specify testing frequency: **Annually for 3-yrs, every 3rd year after 1st 3-years**

NOTE - Proposed test method subject to approval and possible change during the test protocol process

Attach Additional Sheets As Necessary

The University of North Carolina at Chapel Hill
Chapel Hill, North Carolina
Orange County

Boiler No. SB-6

Small 2.52 MMBtu/hr Natural Gas (Only) Fired Boiler

A. New Equipment Required to Implement Boiler MACT By May 23, 2019
None

B. Regulatory Changes to Implement Boiler MACT Requirements Effective May 23, 2019.
(Not required for implementation prior to May 23, 2019)

1. New Emission Limits

Boiler	MACT Status	Fuel Classification	Emission Limits, lb/MMBtu (CO-ppm[1])				
			Fil.PM	TSM	HCl	HG	CO
SB-6	Existing	Natural Gas	-	-	-	-	-
			No emission limits for Natural Gas Only Fired Boilers				

1. Work Practice Standards
1.Boiler tuneup every 5-years and a one-time energy assessment

2. Operating Limits
None

3. Continuous Compliance Monitoring
None

4. Reporting and Plan Requirements
1. Initial notification.
2. Compliance status reports.
3. Semiannual compliance reports

FORM B

SPECIFIC EMISSIONS SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 12/01/01 — NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate — **B**

EMISSION SOURCE DESCRIPTION: **1-2.52 MMBtu/hr Natural Gas Fired Boiler**	EMISSION SOURCE ID NO: **ES-SB-6**
	CONTROL DEVICE ID NO(S): **NA**
OPERATING SCENARIO **1** OF **1**	EMISSION POINT (STACK) ID NO(S): **EP-SB-6**

DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

One small 2.52 MMBtu/hr natural gas (only) fired boiler at Davie Hall. Unit is already permitted. No change in emissions with this application. Under the Boiler MACT, small natural gas fired boilers are not subject to any emission limits, monitoring, or performance test requirements. The only applicable requirements are a one-time energy assessment and a 5-year tuneup work practice standard.

TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES):

X Coal,wood,oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manufact. of chemicals/coatings/inks (Form B7)
☐ Int.combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☐ Other (Form B9)

START CONSTRUCTION DATE: **Existing**	OPERATION DATE: **Existing**	DATE MANUFACTURED: **NA**
MANUFACTURER / MODEL NO.: **NA**	EXPECTED OP. SCHEDULE: **NA** HR/DAY **NA** DAY/WK **NA** WK/YR	
IS THIS SOURCE SUBJECT TO? NSPS (SUBPART?): **No**	NESHAP (SUBPART?): **No**	MACT (SUBPART?): **No**
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB **25**	MAR-MAY **25**	JUN-AUG **25** SEP-NOV **25**
EXPECTED ANNUAL HOURS OF OPERATION **NA**	VISIBLE STACK EMISSIONS UNDER NORMAL OPERATION: **<10** % OPACITY	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMSSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMSSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMSSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMSSIONS (AFTER CONTROLS / LIMITS) tons/yr
PARTICULATE MATTER (PM)							
PARTICULATE MATTER<10 MICRONS (PM_{10})							
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)							
SULFUR DIOXIDE (SO2)	***No pollutant emission rates changed with this application***						
NITROGEN OXIDES (NOx)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT AND CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMSSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMSSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMSSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMSSIONS (AFTER CONTROLS / LIMITS) tons/yr
	No pollutant emission rates changed with this application						

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

INDICATE EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS

TOXIC AIR POLLUTANT AND CAS NO.	EF SOURCE	lb/hr	lb/day	lb/yr
	No pollutant emission rates changed with this application			

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) de

COMPLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH SOURCE

Attach Additional Sheets As Necessary

FORM B1

EMISSION SOURCE (WOOD, COAL, OIL, GAS, OTHER FUEL-FIRED BURNER)

REVISED 12/01/01 — NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate — **B1**

EMISSION SOURCE DESCRIPTION: **1 - 2.52 MMBtu/hr Boiler Natural Gas Fired**	EMISSION SOURCE ID NO: **ES-SB-6**
	CONTROL DEVICE ID NO(S): **NA**
OPERATING SCENARIO: **1** OF **1**	EMISSION POINT (STACK) ID NO(S): **EP-SB-6**

DESCRIBE USE: **X** PROCESS HEAT **X** SPACE HEAT ELECTRICAL GENERATION
CONTINUOUS USE STAND BY/EMERGENCY OTHER (DESCRIBE): _____

HEATING MECHANISM: **X** INDIRECT DIRECT

MAX. FIRING RATE (MMBTU/HOUR): **2.52**

WOOD-FIRED BURNER

WOOD TYPE: BARK WOOD/BARK WET WOOD DRY WOOD OTHER (DESCRIBE): _____

PERCENT MOISTURE OF FUEL: _____

UNCONTROLLED CONTROLLED WITH FLYASH REINJECTION CONTROLLED W/O REINJECTION

FUEL FEED METHOD: HEAT TRANSFER MEDIA: STEAM AIR OTHER

METHOD OF TUBE CLEANING: CLEANING SCHEDULE:

COAL-FIRED BURNER

TYPE OF BOILER IF OTHER DESCRIBE:

PULVERIZED	OVERFEED STOKER	UNDERFEED STOKER	SPREADER STOKER	FLUIDIZED BED
☐ WET BED	UNCONTROLLED	UNCONTROLLED	UNCONTROLLED	CIRCULATING
☐ DRY BED	CONTROLLED	CONTROLLED	FLYASH REINJECTION	RECIRCULATING
			NO FLYASH REINJECTION	

METHOD OF LOADING: CYCLONE HANDFIRED TRAVELING GRATE OTHER (DESCRIBE): _____

METHOD OF TUBE CLEANING: CLEANING SCHEDULE:

OIL/GAS-FIRED BURNER

TYPE OF BOILER: ☐ UTILITY c INDUSTRIAL ☐ COMMERCIAL ☐ RESIDENTIAL **X Institutional**

TYPE OF FIRING: **X** NORMAL ☐ TANGENTIAL ☐ LOW NOX BURNERS ☐ NO LOW NOX BURNER

METHOD OF TUBE CLEANING: **NA** CLEANING SCHEDULE: **NA**

OTHER FUEL-FIRED BURNER

TYPE OF FUEL: _____ PERCENT MOISTURE: _____

TYPE OF BOILER: ☐ UTILITY ☐ INDUSTRIAL ☐ COMMERCIAL ☐ RESIDENTIAL

TYPE OF FIRING: _____ TYPE OF CONTROL (IF ANY): _____ FUEL FEED METHOD: _____

METHOD OF TUBE CLEANING: CLEANING SCHEDULE:

FUEL USAGE (INCLUDE STARTUP/BACKUP FUELS)

FUEL TYPE	UNITS	MAXIMUM DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION (UNIT/HR)
Natural Gas	**cu. ft.**	**2,447 cu.ft. based on 1030 Btu/cu.ft.**	**None**
No.2 Fuel Oil			

FUEL CHARACTERISTICS (COMPLETE ALL THAT ARE APPLICABLE)

FUEL TYPE	SPECIFIC BTU CONTENT	SULFUR CONTENT (% BY WEIGHT)	ASH CONTENT (% BY WEIGHT)
Natural Gas	**Max. 1030 Btu/cu.ft.**	**NA**	**NA**
No.2 Fuel Oil			

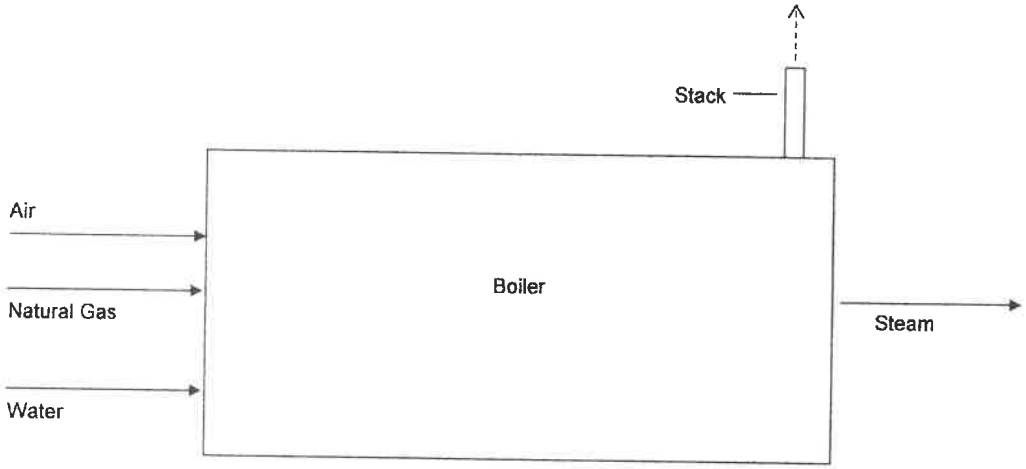
SAMPLING PORTS, COMPLIANT WITH EPA METHOD 1 WILL BE INSTALLED ON THE STACKS: **X** YES NO

COMMENTS:

Attach Additional Sheets As Necessary

The University of North Carolina at Chapel Hill
Chapel Hill, North Carolina
Orange County

2.52 MMBtu/hr Natural Gas-Fired Boiler



Flow Diagram

FORM E3

EMISSION SOURCE COMPLIANCE METHOD

REVISED 12/01/01 — NCDENR/Division Of Air Quality - Application for Air Permit to Construct/Operate — E3

Emission Source ID NO. **ES-SB-6**

Regulated Pollutant: **Filterable PM, HCl, Hg, & CO**

Applicable Regulation: **40 CFR 63, Subpart DDDDD Boiler MACT**

Alternative Operating Scenario (AOS) NO: **Natural Gas Only**

ATTACH A SEPARATE PAGE TO EXPAND ON ANY OF THE BELOW COMMENTS

MONITORING REQUIREMENTS

Is Compliance Assurance Monitoring (CAM) 40 CFR Part 64 Applicable? __ Yes X No

If yes, is CAM Plan Attached (if applicable, CAM plan must be attached)? NA Yes NA No

Describe Monitoring Device Type: **None**

Describe Monitoring Location: **None**

Other Monitoring Methods (Describe In Detail): **One-time Energy Assessment**

Boiler Tuneup every 5-years

Describe the frequency and duration of monitoring and how the data will be recorded (i.e., every 15 minutes, 1 minute instantaneous readings taken to produce an hourly average):

None

RECORDKEEPING REQUIREMENTS

Data (Parameter) being recording: **Annual fuel use**

Frequency of recordkeeping (How often is data recorded?): **Recorded annually**

REPORTING REQUIREMENTS

Generally describe what is being reported: **Annual fuel use**

Frequency: __ MONTHLY __ QUARTERLY __ EVERY 6 MONTHS

X OTHER (DESCRIBE): **Annually**

TESTING

Specify proposed reference test method: **NA**

Specify reference test method rule and citation: **NA**

Specify testing frequency: **NA**

NOTE - Proposed test method subject to approval and possible change during the test protocol process

Attach Additional Sheets As Necessary

The University of North Carolina at Chapel Hill
Chapel Hill, North Carolina
Orange County

Facility-wide Forms

FORM D1

FACILITY-WIDE EMISSIONS SUMMARY

REVISED 12/01/01 — NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate — D1

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION - FACILITY-WIDE

AIR POLLUTANT EMITTED	EXPECTED ACTUAL EMISSIONS (AFTER CONTROLS / LIMITATIONS) tons/yr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITATIONS) tons/yr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITATIONS) tons/yr
PARTICULATE MATTER (PM)	11.82	-	-
PARTICULATE MATTER < 10 MICRONS (PM_{10})	11.82	-	-
PARTICULATE MATTER < 2.5 MICRONS ($PM_{2.5}$)	8.73	-	-
SULFUR DIOXIDE (SO2)	239.85	-	-
NITROGEN OXIDES (NOx)	286.72	-	-
CARBON MONOXIDE (CO)	60.2	-	-
VOLATILE ORGANIC COMPOUNDS (VOC)	2.82	-	-
LEAD	*Actual Emissions from 2016 Annual Emissions Inventory*		
OTHER			

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION - FACILITY-WIDE

HAZARDOUS AIR POLLUTANT EMITTED	CAS NO.	EXPECTED ACTUAL EMISSIONS (AFTER CONTROLS / LIMITATIONS) tons/yr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITATIONS) tons/yr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITATIONS) tons/yr
(Extensive list of pollutants, see 2016 Annual Emissions Inventory for all actual HAP emissions)				

TOXIC AIR POLLUTANT EMISSIONS INFORMATION - FACILITY-WIDE

INDICATE REQUESTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS. EMISSIONS ABOVE THE TOXIC PERMIT EMISSION RATE (TPER) IN 15A NCAC 2Q .0711 MAY REQUIRE AIR DISPERSION MODELING. USE NETTING FORM D2 IF NECESSARY.

TOXIC AIR POLLUTANT EMITTED	CAS NO.	lb/hr	lb/day	lb/year	Modeling Required ? Yes	No
(Extensive list of pollutants, see 2016 Annual Emissions Inventory for all actual TAP emissions)						

COMMENTS:

Attach Additional Sheets As Necessary

FORM E1

TITLE V GENERAL INFORMATION

REVISED: 12/01/01 — Division of Air Quality - Application for Air Permit to Construct/Operate — E1

IF YOUR FACILITY IS CLASSIFIED AS "MAJOR" FOR TITLE V YOU MUST COMPLETE THIS FORM AND ALL OTHER REQUIRED "E" FORMS (E2 THROUGH E5 AS APPLICABLE)

Indicate here if your facility is subject to Title V by: X Emissions X Other

If subject to Title V by other, check or specify: X NSPS X NESHAPS (MACT) NA TITLE IV

Other, specify:

If you are or will be subject to any maximum achievable control technology standards (MACT) issued pursuant to section 112(d) of the Clean Air Act, specify below:

EMISSION SOURCE ID	*EMISSION SOURCE DESCRIPTION*	*MACT*
ES-001	323.17 MMBtu/hr boiler	40 CFR 63 - Subpart DDDDD - Boiler MACT
ES-002	323.17 MMBtu/hr boiler	40 CFR 63 - Subpart DDDDD - Boiler MACT
ES-003	338.0 MMBtu/hr boiler	40 CFR 63 - Subpart DDDDD - Boiler MACT
ES-004	249.0 MMBtu/hr boiler	40 CFR 63 - Subpart DDDDD - Boiler MACT
ES-005	249.0 MMBtu/hr boiler	40 CFR 63 - Subpart DDDDD - Boiler MACT
ES-SB-6	2.52 MMBtu/hr boiler	40 CFR 63 - Subpart DDDDD - Boiler MACT
ES-006	2,000 kW generator	40 CFR 63 - Subpart ZZZZ - RICE MACT
ES-007	2,000 kW generator	40 CFR 63 - Subpart ZZZZ - RICE MACT
87 Em. Generators and Fire Pumps	All Emergency Generators and Fire Pumps	40 CFR 63 - Subpart ZZZZ - RICE MACT

List any additional regulation which are requested to be included in the shield and provide a detailed explanation as to why the shield should be granted:

REGULATION	*EMISSION SOURCE (Include ID)*	*EXPLANATION*
All	All	See Permit No. 03069T34 for existing sources and applicable regulations

Comments: **All air pollution sources at the University and applicable regulations are identified in Permit No. 03069T34. All applicable regulations should be included in the permit shield.**

Attach Additional Sheets As Necessary

FORM E2

EMISSION SOURCE APPLICABLE REGULATION LISTING

REVISED 12/01/01

Division of Air Quality - Application for Air Permit to Construct/Operate

E2

EMISSION SOURCE ID NO.	EMISSION SOURCE DESCRIPTION	OPERATING SCENARIO INDICATE PRIMARY (P) OR ALTERNATIVE (A)	POLLUTANT	APPLICABLE REGULATION
Boilers Subject to the Boiler MACT Provisions In This Application				
ES-001 - 005	Five Large Boilers	All	SO_2	40 CFR 60, Subpart Db
ES-001 - 005	Five Large Boilers	All	NOx	40 CFR 60, Subpart Db
ES-001 - 005	Five Large Boilers	All	V.E.s	40 CFR 60, Subpart Db
ES-001 - 005	Five Large Boilers	All	HAPs	40 CFR 63, Subpart DDDDD
ES-SB-6	One Small Natural Gas-Fired Boiler	All	HAPs	40 CFR 63, Subpart DDDDD

Attach Additional Sheets As Necessary

FORM E4

EMISSION SOURCE COMPLIANCE SCHEDULE

COMPLIANCE STATUS WITH RESPECT TO ALL APPLICABLE REQUIREMENTS

Will each emission source at your facility be in compliance with all applicable requirements at the time of permit issuance and continue to comply with these requirements?

X Yes ___ No **If NO**, complete **A** through **F** below for each requirement for which compliance is not achieved.

Will your facility be in compliance with all applicable requirements taking effect during the term of the permit and meet such requirements on a timely basis?

X Yes ___ No **If NO**, complete **A** through **F** below for each requirement for which compliance is not achieved.

If this application is for a modification of existing emissions source(s), is each emission source currently in compliance with all applicable requirements?

X Yes ___ No **If NO**, complete **A** through **F** below for each requirement for which compliance is not achieved.

A. Emission Source Description (Include ID NO.) _____

B. Identify applicable requirement for which compliance is not achieved:

_____

C. Narrative description of how compliance will be achieved with this applicable requirements:

_____

D. Detailed Schedule of Compliance:

Step(s)	Date Expected

E. Frequency for submittal of progress reports (6 month minimum):

_____

F. Starting date of submittal of progress reports: _____

Attach Additional Sheets As Necessary

FORM E5

TITLE V COMPLIANCE CERTIFICATION (Required)

In accordance with the provisions of Title 15A NCAC 2Q .0520 the responsible company official of:

SITE NAME: The University of North Carolina at Chapel Hill

SITE ADDRESS: 200 E. Cameron Avenue, CB#1000

CITY, NC : Chapel Hill, North Carolina

COUNTY: Orange

PERMIT NUMBER : 03069T34

CERTIFIES THAT(Check the appropriate box):

X The facility is in compliance with all applicable requirements

_____ The facility is not currently incompliance with all applicable requirements

If this box is checked, you must also complete form E4 "Emission Source Compliance Schedule"

The undersigned certifies under the penalty of law, that all information and statements provided in the application, based on information and belief formed after reasonable inquiry, are true, accurate, and complete.

Jonathan Pruitt Date: 3-16-18

Signature of responsible company official (REQUIRED, USE BLUE INK)

Jonathan Pruitt, Vice Chancellor for Finance and Operations

Name, Title of responsible company official (Type or print)

Attach Additional Sheets As Necessary

FORM D

TECHNICAL ANALYSIS TO SUPPORT PERMIT APPLICATION

REVISED: 12/01/01 | NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate | D5

PROVIDE DETAILED TECHNICAL CALCULATIONS TO SUPPORT ALL EMISSION, CONTROL, AND REGULATORY DEMONSTRATIONS MADE IN THIS APPLICATION. INCLUDE A COMPREHENSIVE PROCESS FLOW DIAGRAM AS NECESSARY TO SUPPORT AND CLARIFY CALCULATIONS AND ASSUMPTIONS. ADDRESS THE FOLLOWING SPECIFIC ISSUES ON SEPARATE PAGES:

A	**SPECIFIC EMISSIONS SOURCE (EMISSION INFORMATION) (FORM B)** - SHOW CALCULATIONS USED, INCLUDING EMISSION FACTORS, MATERIAL BALANCES, AND/OR OTHER METHODS FROM WHICH THE POLLUTANT EMISSION RATES IN THIS APPLICATION WERE DERIVED. INCLUDE CALCULATION OF POTENTIAL BEFORE AND, WHERE APPLICABLE, AFTER CONTROLS. CLEARLY STATE ANY ASSUMPTIONS MADE AND PROVIDE ANY REFERENCES AS NEEDED TO SUPPORT MATERIAL BALANCE CALCULATIONS.
B	**SPECIFIC EMISSION SOURCE (REGULATORY INFORMATION)(FORM E2 - TITLE V ONLY)** - PROVIDE AN ANALYSIS OF ANY REGULATIONS APPLICABLE TO INDIVIDUAL SOURCES AND THE FACILITY AS A WHOLE. INCLUDE A DISCUSSION OUTING METHODS (e.g. FOR TESTING AND/OR MONITORING REQUIREMENTS) FOR COMPLYING WITH APPLICABLE REGULATIONS, PARTICULARLY THOSE REGULATIONS LIMITING EMISSIONS BASED ON PROCESS RATES OR OTHER OPERATIONAL PARAMETERS. PROVIDE JUSTIFICATION FOR AVOIDANCE OF ANY FEDERAL REGULATIONS (PREVENTION OF SIGNIFICANT DETERIORATION (PSD), NEW SOURCE PERFORMANCE STANDARDS (NSPS), NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (NESHAPS), TITLE V), INCLUDING EXEMPTIONS FROM THE FEDERAL REGULATIONS WHICH WOULD OTHERWISE BE APPLICABLE TO THIS FACILITY. SUBMIT ANY REQUIRED TO DOCUMENT COMPLIANCE WITH ANY REGULATIONS. INCLUDE EMISSION RATES CALCULATED IN ITEM "A" ABOVE, DATES OF MANUFACTURE, CONTROL EQUIPMENT, ETC. TO SUPPORT THESE CALCULATIONS.
C	**CONTROL DEVICE ANALYSIS (FORM C)** - PROVIDE A TECHNICAL EVALUATION WITH SUPPORTING REFERENCES FOR ANY CONTROL EFFICIENCIES LISTED ON SECTION C FORMS, OR USED TO REDUCE EMISSION RATES IN CALCULATIONS UNDER ITEM "A" ABOVE. INCLUDE PERTINENT OPERATING PARAMETERS (e.g. OPERATING CONDITIONS, MANUFACTURING RECOMMENDATIONS, AND PARAMETERS AS APPLIED FOR IN THIS APPLICATION) CRITICAL TO ENSURING PROPER PERFORMANCE OF THE CONTROL DEVICES). INCLUDE AND LIMITATIONS OR MALFUNCTION POTENTIAL FOR THE PARTICULAR CONTROL DEVICES AS EMPLOYED AT THIS FACILITY. DETAIL PROCEDURES FOR ASSURING PROPER OPERATION OF THE CONTROL DEVICE INCLUDING MONITORING SYSTEMS AND MAINTENANCE TO BE PERFORMED.
D	**PROCESS AND OPERATIONAL COMPLIANCE ANALYSIS - (FORM E3 - TITLE V ONLY)** - SHOWING HOW COMPLIANCE WILL BE ACHIEVED WHEN USING PROCESS, OPERATIONAL, OR OTHER DATA TO DEMONSTRATE COMPLIANCE. REFER TO COMPLIANCE REQUIREMENTS IN THE REGULATORY ANALYSIS IN ITEM "B" WHERE APPROPRIATE. LIST ANY CONDITIONS OR PARAMETERS THAT CAN BE MONITORED AND REPORTED TO DEMONSTRATE COMPLIANCE WITH THE APPLICABLE REGULATIONS.
E	**PROFESSIONAL ENGINEERING SEAL** - PURSUANT TO 15A NCAC 2Q .0112 "APPLICATION REQUIRING A PROFESSIONAL ENGINEERING SEAL," A PROFESSIONAL ENGINEER REGISTERED IN NORTH CAROLINA SHALL BE REQUIRED TO SEAL TECHNICAL PORTIONS OF THIS APPLICATION FOR NEW SOURCES AND MODIFICATIONS OF EXISTING SOURCES. (SEE INSTRUCTIONS FOR FURTHER APPLICABILITY).

I, Stacy Smith, P.E., attest that this application for The University of North Carolina at Chapel Hill has been reviewed by me and is accurate, complete and consistent with the information supplied in the engineering plans, calculations, and all other supporting documentation to the best of my knowledge. I further attest that to the best of my knowledge the proposed design has been prepared in accordance with the applicable regulations. Although certain portions of this submittal package may have been developed by other professionals, inclusion of these materials under my seal signifies that I have reviewed this material and have judged it to be consistent with the proposed design. Note: In accordance with NC General Statutes 143-215.6A and 143-215.6B, any person who knowingly makes any false statement, representation, or certification in any application shall be guilty of a Class 2 misdemeanor which may include a fine not to exceed $10,000 as well as civil penalties up to $25,000 per violation.

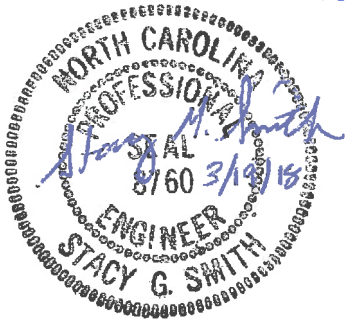
Received
MAR 19 2018
Air Permits Section

(PLEASE USE BLUE INK TO COMPLETE THE FOLLOWING)

NAME:	Stacy G. Smith
DATE:	3/19/2018
COMPANY:	RST Engineering, PLLC
ADDRESS:	5416 Orchard Oriole Trail, Wake Forest, N.C.
TELEPHONE:	(919) 810 -9875
SIGNATURE:	Stacy G. Smith
PAGES CERTIFIED:	Entire Application

(IDENTIFY ABOVE EACH PERMIT FORM AND ATTACHMENT THAT IS BEING CERTIFIED BY THIS SEAL)

PLACE NORTH CAROLINA SEAL HERE



RST Engineering, PLLC

Attach Additional Sheets As Necessary

The University of North Carolina at Chapel Hill
Chapel Hill, North Carolina
Orange County

DSI Preliminary Design Specifications

The University of North Carolina at Chapel Hill
Chapel Hill, North Carolina
Orange County

DSI Preliminary Design Specifications

Given:

323.17	MMBtu/hr, max. firing rate of B6 & B7, each
12,500	Btu/lb, typical coal HHV
2,000	ppm wt., max. expected coal chlorine content
0	%, worse-case assumed HCl control by existing limestone injection into furnace
0.022	lb/MMBtu, Boiler MACT HCl limit
400	**lb/hr, max. sorbent injection rate capacity of proposed DSI**
35.453	MW, chlorine
1.00794	MW, hydrogen
36.4609	MW, HCl
74.093	MW, calcium hydroxide [$Ca(OH)_2$]
110.98	MW, calcium chloride [$CaCl_2$]
0.5	mole/mole, moles $Ca(OH)_2$ required/mole of HCl

Calculations:

Maximum Potential Uncontrolled HCl

0.165	lb/MMBtu, max. uncontrolled HCl
53.18	lb/hr, max. uncontrolled HCl
1.458	lbmole/hr, uncontrolled HCl

Maximum Required HCl Reduction

0.022	lb/MMBtu, Boiler MACT HCl limit
0.143	lb/MMBtu, required HCl reduction
46.07	lb/hr, required HCl reduction
1.263	lbmole/hr, required HCl reduction
86.6%	required HCl reduction

Theoretical $Ca(OH)_2$ Required at Maximum Required HCl Reduction

0.5	mole/mole, moles $Ca(OH)_2$ required/mole of HCl reduced
0.632	lbmole/hr, theoretical $Ca(OH)_2$ required
46.807	lb/hr, theoretical $Ca(OH)_2$ required

Potential $Ca(OH)_2$ Injection Rate Provided

400	lb/hr, max. potential $Ca(OH)_2$ injection rate

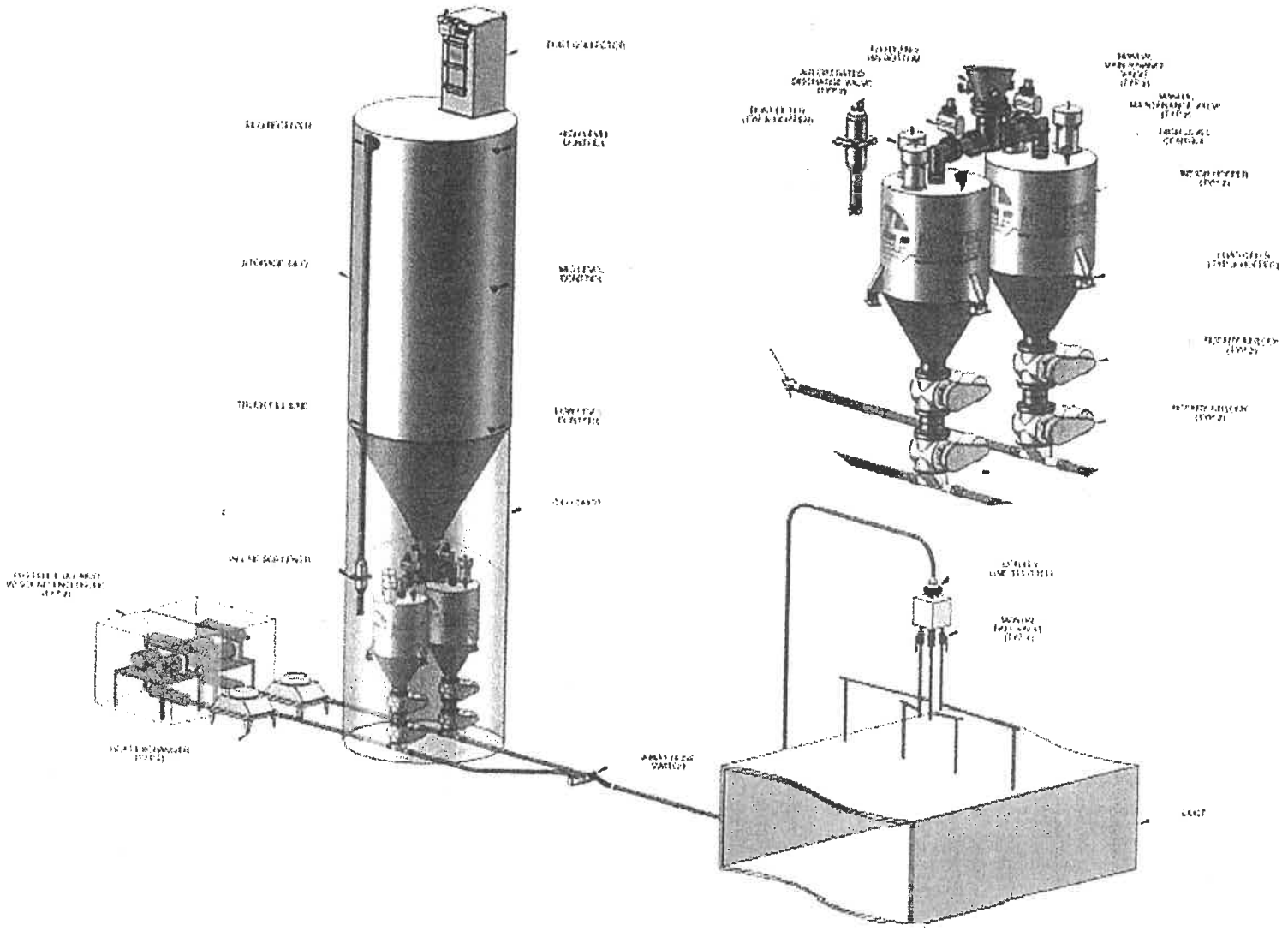
Conclusion: The proposed DSI systems have the capacity to inject more than 8.5 times the theoretical required $Ca(OH)_2$ injection rate required for the worse-case coal HCl emissions. The actual sorbent injection rate required to meet the Boiler MACT HCl limit will depend on the actual stoichiometric ratio necessary and will be established during the initial performance tests.

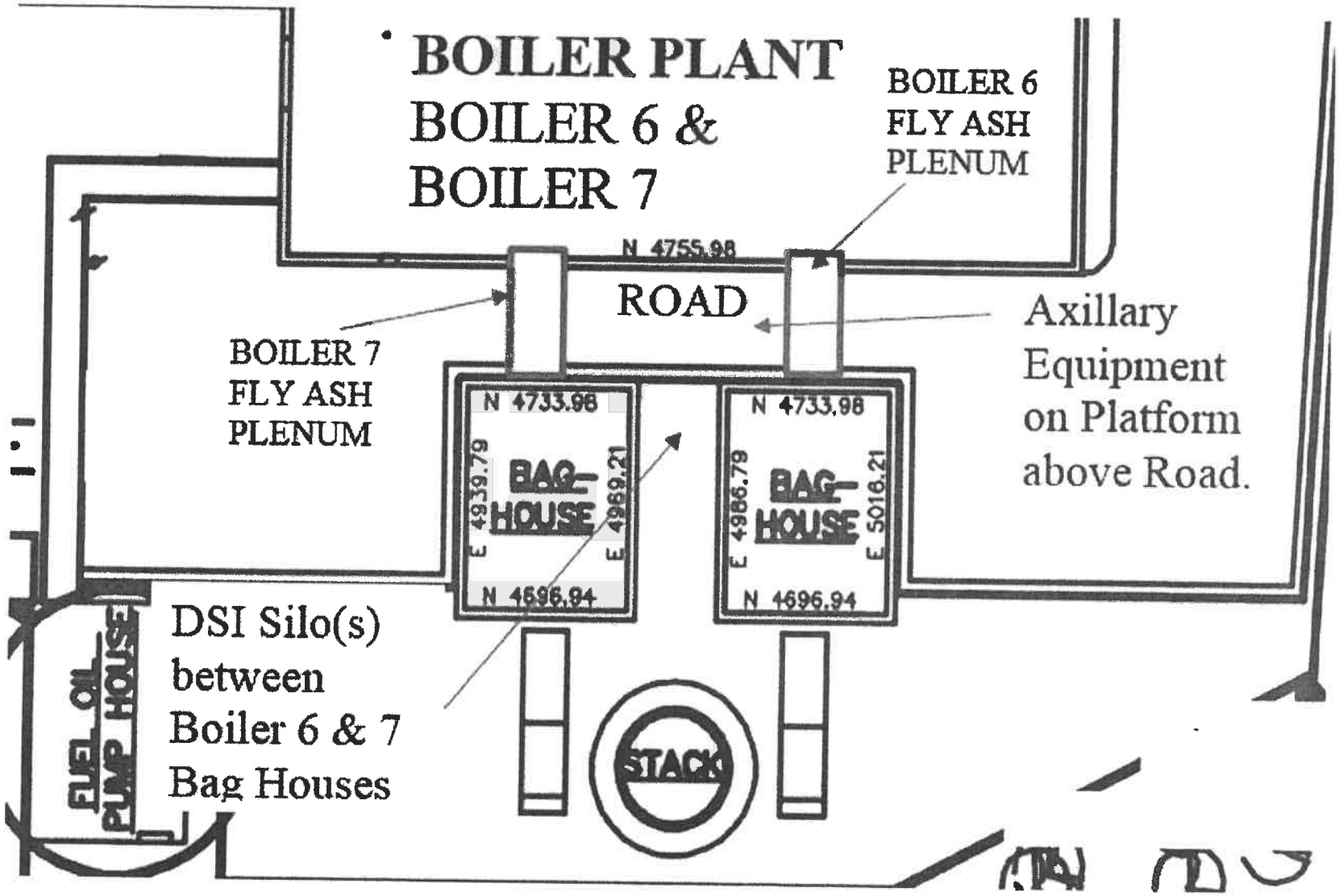
Reaction Equation - $Ca(OH)_2 + 2HCl \rightarrow CaCl_2 + 2H_2O$

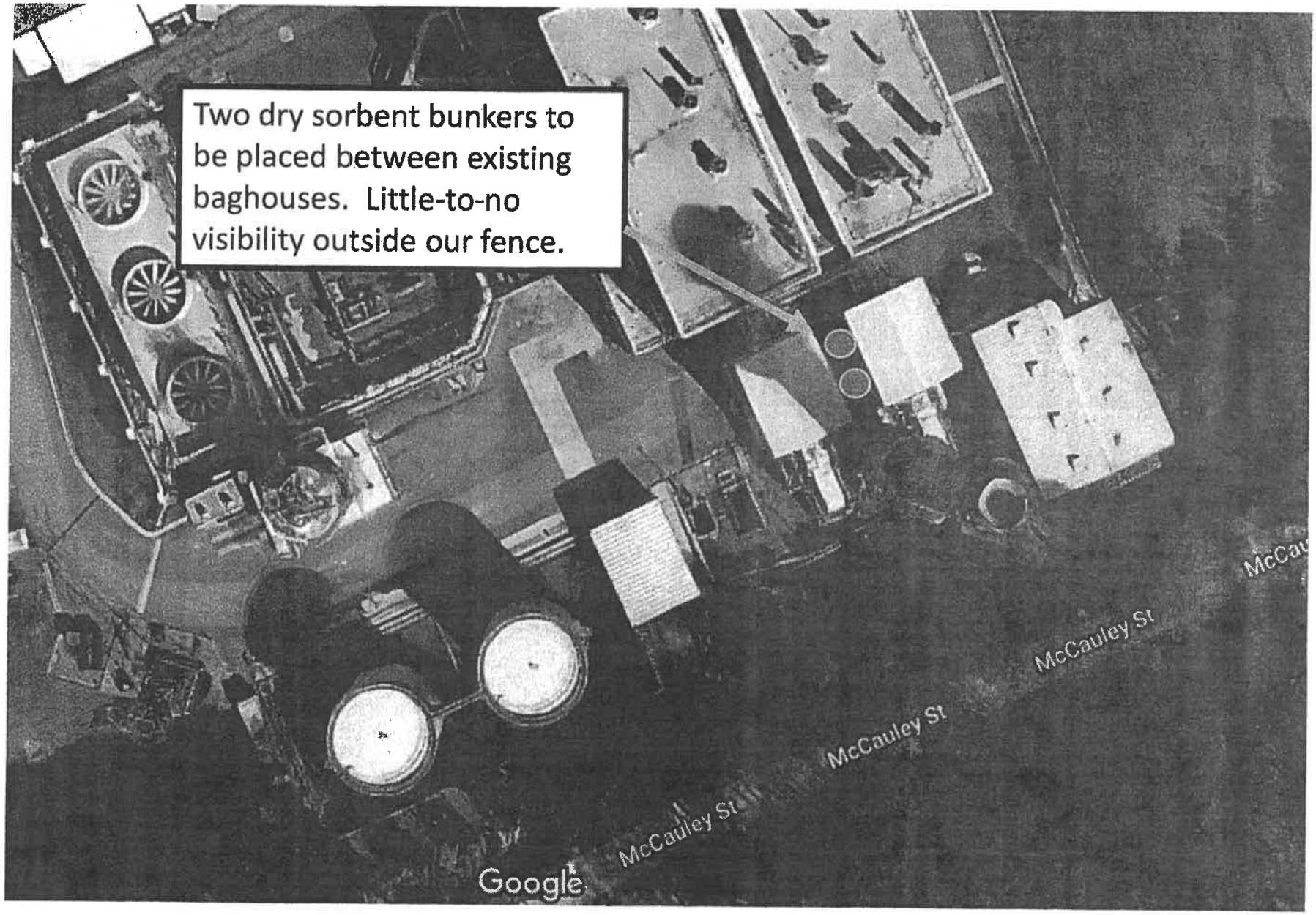
The University of North Carolina at Chapel Hill
Chapel Hill, North Carolina
Orange County

DSI Preliminary Conceptual Schematics and Figures

Typical setup from one possible vendor, for one boiler.




BOILER PLANT
BOILER 6 &
BOILER 7
BOILER 6
FLY ASH
PLENUM
N 4755.98
ROAD
BOILER 7
FLY ASH
PLENUM
Axillary
Equipment
on Platform
above Road.
N 4733.98
E 4939.79
BAG
HOUSE
E 4969.21
N 4696.94
N 4733.98
E 4986.79
BAG
HOUSE
E 5016.21
N 4696.94
DSI Silo(s)
between
Boiler 6 & 7
Bag Houses
FUEL OIL
PUMP HOUSE
STACK


Two dry sorbent bunkers to be placed between existing baghouses. Little-to-no visibility outside our fence.
McCauley St
McCauley St
McCauley St
Google

Potential Emissions 100% Coal Firing

The University of North Carolina at Chapel Hill
Chapel Hill, North Carolina
Orange County

New Potential Emissions

PM and HCl Only Pollutant Potentials Changed with This Application

Operational Parameters- Baseline - Coal Firing at 100%

323.17 MMBtu/hr, heat input
12,500 Btu/lb, coal heating value
12.93 ton/hr, coal firing rate
8,760 hr/yr
99.8% PM control
98.0% PM10 control
96.0% PM2.5 control
0.0040 lb/MMBtu, Max. Filterable PM from 1/13/16 test
423.3 lb/hr, Max. Uncontrolled Filterable PM increase w/reacted & unreacted Ca(OH)2 from DSI
0.0026 lb/MMBtu, Max. Controlled Filterable PM increase w/reacted & unreacted Ca(OH)2 from DSI
0.0066 lb/MMBtu, Max. Filterable PM
0.022 lb/MMBtu, HCl MACT limit
0.04 lb/MMBtu, Filterable PM MACT Limit

Potential Emissions - 1-323.17 MMBtu/hr Boiler

Pollutant		Emissions (lb/hr)	Emissions (lb/yr)	Emissions (ton/yr)
NOx	0.397 lb/MMBtu[1]	128.30	1,123,895	561.95
CO	0.0341 lb/MMBtu[1]	11.02	96,536	48.27
SO_2	0.2 lb/MMBtu[2]	64.634	566,194	283.10
PM	0.02995 lb/MMBtu[1]	9.679	84,788	42.39
Filterable PM	**0.0066 lb/MMBtu**	**2.139**	**18,740**	**9.37**
PM_{10}	12.4 lb/ton (AP-42)	3.206	28,083	14.04
$PM_{2.5}$	0.006675 lb/MMBtu[1]	2.157	18,897	9.45
VOC	0.00233 lb/MMBtu[1]	0.753	6,596	3.30
	lb/ton[3]			
Acetaldehyde	5.70E-04	7.37E-03	6.45E+01	3.23E-02
Acetophenone	-	0.00E+00	0.00E+00	0.00E+00
Acrolein	2.90E-04	3.75E-03	3.28E+01	1.64E-02
Antimony	3.23E-07 lb/MMBtu[1]	1.04E-04	9.14E-01	4.57E-04
Arsenic	3.01E-07 lb/MMBtu[1]	9.73E-05	8.52E-01	4.26E-04
Benzene	1.30E-03	1.68E-02	1.47E+02	7.36E-02
Benzo(a)pyrene	3.80E-08	4.91E-07	4.30E-03	2.15E-06
Benzyl chloride	7.00E-04	9.05E-03	7.93E+01	3.96E-02
Beryllium	5.28E-08 lb/MMBtu[1]	1.69E-05	1.48E-01	7.40E-05
Cadmium	1.39E-07 lb/MMBtu[1]	4.49E-05	3.94E-01	1.97E-04
Carbon disulfide	1.30E-04	1.68E-03	1.47E+01	7.36E-03
Carbon tetrachloride	-	0.00E+00	0.00E+00	0.00E+00
Chlorine (2006 tests)	1.08E-04 lb/MMBtu	3.49E-02	3.06E+02	1.53E-01
Chlorobenzene	2.20E-05	2.84E-04	2.49E+00	1.25E-03
Chloroform	5.90E-05	7.63E-04	6.68E+00	3.34E-03
Chromium	4.80E-06 lb/MMBtu[1]	1.55E-03	1.36E+01	6.79E-03
Cobalt	2.76E-07 lb/MMBtu[1]	8.92E-05	7.81E-01	3.91E-04
Di(2-ethylhexyl)phthalate	-	0.00E+00	0.00E+00	0.00E+00
Dimethyl sulfate	4.80E-05	6.20E-04	5.44E+00	2.72E-03
Dinitrophenol, 2,4-	-	0.00E+00	0.00E+00	0.00E+00
Ethyl Benzene	-	0.00E+00	0.00E+00	0.00E+00
Ethylene dibromide	1.20E-06	1.55E-05	1.36E-01	6.79E-05
Ethylene dichloride	4.00E-05	5.17E-04	4.53E+00	2.26E-03
Formaldehyde	2.40E-04	3.10E-03	2.72E+01	1.36E-02
Hexachlorodibenzo-p-dioxin	-	0.00E+00	0.00E+00	0.00E+00
Hexane	6.70E-05	8.66E-04	7.59E+00	3.79E-03
Hydrogen Chloride	**0.022 lb/MMBtu**	**7.11E+00**	**62,281**	**31.14**
Hydrogen Fluoride	0.00023 lb/MMBtu[1]	7.43E-02	651	0.33
Lead	1.76E-06 lb/MMBtu[1]	5.69E-04	4.98E+00	2.49E-03
Manganese	1.20E-05 lb/MMBtu[1]	3.88E-03	3.40E+01	1.70E-02
Mercury	8.37E-07 lb/MMBtu[1]	2.70E-04	2.37E+00	1.18E-03
Methyl bromide	-	0.00E+00	0.00E+00	0.00E+00
Methyl chloride	-	0.00E+00	0.00E+00	0.00E+00
Methyl chloroform	2.00E-05	2.59E-04	2.26E+00	1.13E-03
Methyl ethyl ketone	3.90E-04	5.04E-03	4.42E+01	2.21E-02
Methylene chloride	2.90E-04	3.75E-03	3.28E+01	1.64E-02
Naphthalene	-	0.00E+00	0.00E+00	0.00E+00
Nickel	9.77E-06 lb/MMBtu[1]	3.16E-03	2.77E+01	1.38E-02
Nitrophenol, 4-	-	0.00E+00	0.00E+00	0.00E+00
Pentachlorophenol	-	0.00E+00	0.00E+00	0.00E+00
Perchloroethylene	-	0.00E+00	0.00E+00	0.00E+00
Phenol	1.60E-05	2.07E-04	1.81E+00	9.06E-04
Phosphorus	1.46E-06 lb/MMBtu[1]	4.72E-04	4.13E+00	2.07E-03
Polychlorinated biphenyls	-	0.00E+00	0.00E+00	0.00E+00
POM	-	0.00E+00	0.00E+00	0.00E+00
Propionaldehyde	-	0.00E+00	0.00E+00	0.00E+00
Propylene dichloride	-	0.00E+00	0.00E+00	0.00E+00
Selenium	2.15E-07 lb/MMBtu[1]	6.95E-05	6.09E-01	3.04E-04
Styrene	2.50E-05	3.23E-04	2.83E+00	1.42E-03
2,3,7,8-TCDD	1.43E-11	1.85E-10	1.62E-06	8.10E-10
Toluene	2.40E-04	3.10E-03	2.72E+01	1.36E-02
Trichloroethylene	-	0.00E+00	0.00E+00	0.00E+00
Trichlorofluoromethane	-	0.00E+00	0.00E+00	0.00E+00
Trichlorophenol	-	0.00E+00	0.00E+00	0.00E+00
Vinyl chloride	-	0.00E+00	0.00E+00	0.00E+00
Xylenes	3.70E-05	4.78E-04	4.19E+00	2.09E-03
	lb/ton[3]			
Carbon Dioxide	5221.82	67501.5	591,312,864	295,656
Methane	0.060	0.776	6,794	3.40
N_2O	3.36	43.43	380,482	190.24

1-Stack test data from August 2009 EPA Boiler MACT test program.
2-NSPS Subpart Db controlled SO_2 limit.
3-DAQ coal combustion spreadsheet.

The University of North Carolina at Chapel Hill
Chapel Hill, North Carolina
Orange County

Potential Emissions -Hydrated Lime Storage Silos (2 units)

Emissions per Silo

Given: a DSI System
400.00 lb/hr, maximum Ca(OH)2
8760 hrs/yr, maximum potential boiler operating rate
1752.00 ton/yr, maximum Ca(OH)2 used per boiler

b. Ca(OH)2 Storage Silos

From AP-42 - Cement Silos at Concrete Batch Plants

1. Uncontrolled Emission Factors (EF)
0.73 lb/ton, PM
0.47 lb/ton, PM10

2. Controlled Emission Factors (EF)
0.00099 lb/ton, PM
0.00034 lb/ton, PM10

Calculations:

a. Maximum Potential Uncontrolled Emissions
1278.96 lb/yr, PM
0.639 ton/yr, PM

823.44 lb/yr, PM10
0.412 ton/yr, PM10

b. Maximum Potential Controlled Emissions
1.73 lb/yr, PM
0.00087 ton/yr, PM

0.596 lb/yr, PM10
0.000298 ton/yr, PM10

Conclusion:

Each silo is an insignificant sources excluded from permitting per 15A NCAC 02Q .0102(h)(5).

BOILER MACT COMPLIANCE PLAN

THE UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL

Final Standard 12/21/12
Compliance Date May 23, 2019

March 2018

Table 1 Affected Units and Classifications

Boiler	Location	MMBtu/hr	Fuels	Classification	
				Current	Alternative
No.6	Cogen	323.17	Coal N. Gas No.2 Oil Wood	fluidized-bed solid fuel unit	-
No.7	Cogen	323.17	Coal N. Gas No.2 Oil Wood	fluidized-bed solid fuel unit	-
No.8	Cogen	338	N. Gas No.2 Oil	light liquid fuel unit	gas 1 fuel unit[1]
No.9	Manning	249	N. Gas No.2 Oil	light liquid fuel unit	gas 1 fuel unit[1]
No.10	Manning	249	N. Gas No.2 Oil	light liquid fuel unit	gas 1 fuel unit[1]
SB-6	Davie Hall	2.52	N. Gas	gas 1 fuel unit	-

1-These units may be classified as gas 1 units if No.2 fuel oil combustion is limited solely to periods of natural gas curtailments. Gas 1 units are subject to less stringent requiremnts.

Table 2 Final Boiler MACT Emission Limits and Current Compliance Status

Boiler	MACT Status	Fuel Classification	Emission Limits, lb/MMBtu (CO-ppm[2])					Current Emissions, lb/MMBtu (CO-ppm[2])					Compliance without Additional Controls				
			PM[1]	TSM[1]	HCl	HG	CO[2]	Fil.PM[1]	TSM[1]	HCl	HG[15]	CO[2]	Fil.PM	TSM[1]	HCl	HG	CO[2]
No.6	Existing[6]	Coal[5]	0.04	5.3E-05	0.022	5.7E-06	130[13]	0.0040[11]	-	0.033[8]	4.30E-07	26.8	Yes	-	Problematic[9]	Yes	Yes
		No.2 Oil[3]	0.0079	6.2E-05	0.0011	2.0E-06	130[12]	-	-	-	-	-	Expected	-	Expected	Expected	Expected
		N. Gas[3]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Biomass[4]	0.11	1.2E-03	0.022	5.7E-06	470[14]	-	-	0.0197[10]	4.74E-07[10]	30[10]	Yes	-	Problematic[9]	Yes	Yes
No.7	Existing[6]	Coal[5]	0.04	5.3E-05	0.022	5.7E-06	130[13]	0.0025[11]	-	0.033[8]	2.75E-07	35.4	Yes	-	Problematic[9]	Yes	Yes
		No.2 Oil[3]	0.0079	6.2E-05	0.0011	2.0E-06	130[12]	-	-	-	-	-	Expected	-	Expected	Expected	Expected
		N. Gas[3]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Biomass[4]	0.11	1.2E-03	0.022	5.7E-06	470[14]	-	-	-	-	-	Yes	-	Problematic[9]	Yes	Yes
No.8[3]	Existing[6]	No.2 Oil[3]	0.0079	6.2E-05	0.0011	2.0E-06	130[12]	-	-	-	-	-	Expected	-	Expected	Expected	Expected
		N. Gas[3]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
No.9[3]	Existing[6]	No.2 Oil[3]	0.0079	6.2E-05	0.0011	2.0E-06	130[12]	-	-	-	-	-	Expected	-	Expected	Expected	Expected
		N. Gas[3]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
No.10[3]	Existing[6]	No.2 Oil[3]	0.0079	6.2E-05	0.0011	2.0E-06	130[12]	-	-	-	-	-	Expected	-	Expected	Expected	Expected
		N. Gas[3]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB-6[7]	Existing[6]	N.Gas	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

1- Filterable PM emission limit allowed in lieu of total selected metals (toxic metals).
2- CO emission limits in units of ppm at 3% O_2. Jan 2016 test results above at 7% O2. December 2014 B6-24.66 B7-20.72 ppmvd at 7% O2, July 2013 B6-57.86 B7-57.63 ppmvd at 7% O2
3- No.2 oil limits do not apply to units if coal/wood is burned and if oil is only used during natural gas curtailments. Only subject to tuneup and energy assessment work practice standards if oil is restricted to gas curtailments only.
4- Units that burn ≥10% biomass (heat input) on an annual basis are subject to the biomass limits.
5-Units that burn ≥10% coal and <10% biomass are subject to the coal-fired limits.
6-New units are constructed after 6/4/10.
7-Small <5 MMBtu/hr natural gas-fired steam boilers are subject to these regulations. However, only subject to a 5-year tuneup requirement.
8-From Jan 2016 test. See Table 4 for other test results.
9-Compliance may be achieved provided coal Cl content is limited. However, additional controls would be required with high Cl content coal. See Table 4
10-From 2011 test at 20% wood pellet cofiring w/80% coal.
11- Filterable PM w/coal from 1/13/16 test. July 2013 B6&B7- 0.0025. March 2014 B6-0.005 B7-0.0013, Dec 2014 B6- 0.0022 B7- 0.0073.
12- CO limit is 130 ppm at 3% O_2.
13- CO limit is 130 ppm for units w/o CO CEMS w/3-run compliance testing: CO limit is 230 ppm 30-day average for units with a CO CEMS. Units wo/CO CEMs must monitor O2 trim.
14- CO limit is 470 ppm for units w/o CO CEMS w/3-run compliance testing: CO limit is 310 ppm 30-day average for units with a CO CEMS. Units wo/CO CEMs must monitor O2 trim.
15- Coal Hg emissions from Jan 2015 test, July 2013 B6-4.9E-08 B7-5.52E-08, December 2014 B6-1.73E-07 B7-1.75E-07, March 2014 B6-1.72E-07 B7-1.61E-07.

Table 3 Comparison of Boiler MACT vs. Current Permit 112(j) Emission Limits
Allowed to Comply with 112(j)Limits Until May 22, 2019

Boiler	MACT Status	Fuel	B. MACT Emission Limits, lb/MMBtu (CO-ppm)					112(j) Emissions Limits, lb/MMBtu (CO-ppm)				
			PM	TSM	HCl	HG	CO	PM	TSM	HCl	HG	CO
No.6	Existing	Coal	0.04	5.3E-05	0.022	5.7E-06	130	0.08	-	435.5 lb/hr	3.0E-06	133
		No.2 Oil	-	-	-	-	-	0.014	-	-	3.0E-06	30
		N. Gas	-	-	-	-	-	-	-	-	-	66
		Biomass	0.11	1.2E-03	0.022	5.7E-06	470	0.39	-	435.5 lb/hr	5.0E-06	834
No.7	Existing	Coal	0.04	5.3E-05	0.022	5.7E-06	130	0.08	-	435.5 lb/hr	3.0E-06	133
		No.2 Oil	-	-	-	-	-	-	-	-	3.0E-06	30
		N. Gas	-	-	-	-	-	-	-	-	-	66
		Biomass	0.11	1.2E-03	0.022	5.7E-06	470	0.39	-	435.5 lb/hr	5.0E-06	834
No.8	Existing	No.2 Oil	0.0079	6.2E-05	0.0011	2.0E-06	130	0.014	-	-	3.0E-06	30
		N. Gas	-	-	-	-	-	-	-	-	-	66**
No.9	Existing[6]	No.2 Oil	0.0079	6.2E-05	0.0011	2.0E-06	130	0.014	-	-	3.0E-06	30
		N. Gas	-	-	-	-	-	-	-	-	-	66**
No.10	Existing[6]	No.2 Oil	0.0079	6.2E-05	0.0011	2.0E-06	130	0.014	-	-	3.0E-06	30
		N. Gas	-	-	-	-	-	-	-	-	-	66**
SB-6	Existing	N.Gas	-	-	-	-	-	-*	-*	-*	-*	-*

*Work practice - annual inspection
**No performance testing required

Table 4

UNC-CH Cogeneration Facility - Coal-Fired Boilers No.6 & 7

HCl Available Test Data

Test Boiler Load/Coal Chlorine/Bed Sorbent Injection						Test HCl		MACT Limit	Required Stack HCl Reduction			
Test	Boiler	MMBtu/hr	Cl_2 ppm	Sorbent	Coal/Sorb.	lb/hr	lb/MMBtu	lb/MMBtu	Percent	lb/hr	MW	mole/hr
11/25/2003	B6	305	750-822	Aragonite	11.99 lb/lb	20.8	0.068	0.022	67.74%	14.09	36.47	0.386
2/19-20/04	B7	321	1425-1567	Limestone	6.57 lb/lb	29.9	0.093	0.022	76.40%	22.84	36.47	0.626
8/9/2009	B6	-	245-693	Limestone	4.28-5.68 lb/lb	4.37	0.013	0.022	Compliant	-	-	-
7/9/2013	B6	57.6% Load	1900	Limestone	11.08 lb/lb	26.5	0.122	0.022	81.97%	21.72	36.47	0.596
7/10/2013	B7	55.2% Load	1900	Limestone	10.79 lb/lb	21.7	0.107	0.022	79.44%	17.24	36.47	0.473
3/4/2014	B6	92.9% Load	867	Limestone	9.00 lb/lb	15.5	0.0454	0.022	51.54%	7.99	36.47	0.219
3/5/2014	B7	93.3% Load	600	Limestone	9.53 lb/lb	13.7	0.0402	0.022	45.27%	6.20	36.47	0.170
12/17/2014	B6	92.7% Load	1077	Limestone	8.57 lb/lb	22.9	0.069	0.022	68.12%	15.60	36.47	0.428
12/18/2014	B7	92.7% Load	730	Limestone	8.54 lb/lb	19.9	0.0582	0.022	62.20%	12.38	36.47	0.339
1/13/2016	B6	± 93% Load	364-652	Limestone	3.81 lb/lb	11.5	0.0326	0.022	32.52%	3.74	36.47	0.103
1/15/2016	B7	± 94% Load	398-620	Limestone	3.89-4.91 lb/lb	11.1	0.0326	0.022	32.52%	3.61	36.47	0.099

323.17 MMBtu/hr - max. firing rate

Reaction Equation - $Ca(OH)_2 + 2HCl \rightarrow CaCl_2 + 2H_2O$

Table 5 Final Boiler MACT Work Practice Standards

Boiler	MACT Status	Limit[1,2,3]
No.6	Existing	Conduct a boiler tuneup every 5-years and a one-time energy assessment Operate all CMS during startup Startup boiler on n.gas or distillate oil When starting to burn coal/biomass, you must start limestone injection/baghouse operation as expeditiously as possible Operate all CMS during shutdown Provide reports of activities during startup and shutdown
No.7	Existing	Conduct a boiler tuneup every 5-years and a one-time energy assessment Operate all CMS during startup Startup boiler on n.gas or distillate oil When starting to burn coal/biomass, you must start limestone injection/baghouse operation as expeditiously as possible Operate all CMS during shutdown Provide reports of activities during startup and shutdown
No.8	Existing	If an O2 trim CMS, conduct a boiler tuneup every 5-years and a one-time energy assessment Operate all CMS during startup and shutdown
No.9	Existing	If an O2 trim CMS, conduct a boiler tuneup every 5-years and a one-time energy assessment Operate all CMS during startup and shutdown
No.10	Existing	If an O2 trim CMS, conduct a boiler tuneup every 5-years and a one-time energy assessment Operate all CMS during startup and shutdown
SB-6	Existing	Conduct a boiler tuneup every 5-years and a one-time energy assessment *Signed certification in Compliance Status Report of performance of initial tuneup and energy assessment*

1- All units equipped with O2 trim monitoring systems, and gas 1/light liguid-fired units <5 MMBtu/hr must conduct a tuneup every 5-years.
2- Units >10 MMBtu/hr without O2 trim CMS must conduct an annual tuneup
3- Units <10 MMBtu/hr without O2 trim CMS, and gas 1/light liquid units 5-10 MMBtu/hr must conduct a biennial tuneup.
4- All boilers, except limited use units (i.e. <10% annual capacity utilization), at a major facility are subject to a one-time energy assessment.

Table 6 Final Boiler MACT Operating Limits

A. PM

Boiler	MACT Status	Fuel	PM Limits: Control Device	PM Limits: Operating Limit
No.6 & No.7	Existing	Coal	Baghouse	Must install PM CEMS/CPMS. Correlation for PM CMS from initial performance test.
		Biomass	Baghouse	<10% opacity (daily average) option with existing COMs, if >10% firing on biomass
		Both	Baghouse	Limit firing rate to 110% of load during performance test (Boiler MACT Table 4)
No.8	Existing	No.2 Oil	None	If classified as an oil-fired unit, limit firing rate to 110% of load during performance test[1]
		N. Gas	None	None, if oil use restricted to gas curtailments only[1]
No.9 & No.10	Existing	No.2 Oil	None	If classified as an oil-fired unit, limit firing rate to 110% of load during performance test[1]
		N. Gas	None	None, if oil use restricted to gas curtailments only[1]

B. HCl

Boiler	MACT Status	Fuel	HCl Limits: Control Device	HCl Limits: Operating Limit
No.6 & No.7	Existing	Coal	Sorbent/Baghouse	Maintain minimum 1-run coal:sorbent injection rate from 3-run performance test.
		Biomass	Sorbent/Baghouse	Maintain minimum 1-run coal:sorbent injection rate from 3-run performance test.
		Both	Sorbent/Baghouse	Limit firing rate to 110% of load during performance test (Boiler MACT Table 4)
		Both	Sorbent/Baghouse	May use SO2 CEMs as a surrogate for lime injection operating limits *SO2 limit set at highest hr average rate during most recent HCl performance test (not an option for Hg operating limits)*
No.8	Existing	No.2 Oil	None	If classified as a light oil-fired unit, limit firing rate to 110% of load during performance test[1]
		N. Gas	None	None, if oil use restricted to gas curtailments only[1]
No.9 & No.10	Existing	No.2 Oil	None	If classified as an oil-fired unit, limit firing rate to 110% of load during performance test[1]
		N. Gas	None	None, if oil use restricted to gas curtailments only[1]

C. Mercury

Boiler	MACT Status	Fuel	Hg Limits: Control Device	Hg Limits: Operating Limit
No.6 & No.7	Existing	Coal	Sorbent/Baghouse	Limit firing rate to 110% of load during performance test (Boiler MACT Table 4)
		Biomass	Sorbent/Baghouse	Limit firing rate to 110% of load during performance test (Boiler MACT Table 4)
		Both	Sorbent/Baghouse	Maintain minimum 1-run coal:sorbent injection rate from 3-run performance test.
No.8	Existing	No.2 Oil	None	If classified as an oil-fired unit, limit firing rate to 110% of load during performance test[1]
		N. Gas	None	None, if oil use restricted to gas curtailments only[1]
No.9 & No.10	Existing	No.2 Oil	None	If classified as an oil-fired unit, limit firing rate to 110% of load during performance test[1]
		N. Gas	None	None, if oil use restricted to gas curtailments only[1]

D. Carbon Monoxide

Boiler	MACT Status	Fuel	CO Limits: Control Device	CO Limits: Operating Limit
No.6 & No.7	Existing	Coal	None	Minimum O2 trim level set during performance test , if no CO CEMs installed
		Biomass	None	Minimum O2 trim level set during performance test , if no CO CEMs installed
		Both	None	Limit firing rate to 110% of load during performance test (Boiler MACT Table 4)
No.8	Existing	No.2 Oil	None	Minimum O2 trim level set during performance test , if no CO CEMs installed
		N. Gas	None	None, if oil use restricted to gas curtailments only[1]
No.9 & No.10	Existing	No.2 Oil	None	Minimum O2 trim level set during performance test , if existing CO CEMs not operated
		N. Gas	None	None, if oil use restricted to gas curtailments only[1]

1- Emission limits do not apply to units if oil is only used during natural gas curtailments and they are classified as Gas 1 units. If Gas 1, these units would only be subject to a 5-yr annual tuneup requirement. If classified as oil-fired, fuel analysis for Cl2 and Hg can be used in lieu of performance test.

Table 7 Final Boiler MACT Initial and Annual Performance Tests

Boiler	MACT Status	Fuel	Initial and Annual[4] Performance Test Required*				
			PM	TSM	HCl	HG	CO
No.6 & No.7	Existing	Coal	Yes	-	Yes[2]	Yes[2]	Yes[3]
		Biomass	Yes	-	Yes[2]	Yes[2]	Yes[3]
No.8[1]	Existing	No.2 Oil	Yes	-	Yes[2]	Yes[2]	Yes[3]
		N. Gas	-	-	-	-	-
No.9 & No.10[1]	Existing	No.2 Oil	Yes	-	Yes[2]	Yes[2]	Yes[3]
		N. Gas	-	-	-	-	-

1- No.2 oil limits do not apply to units if oil is only used during natural gas curtailments. Units would be classified as Gas 1 and only subject to a tuneup requirement.

2- Fuel analysis for Cl2 and Hg content can be used in lieu of a performance test.

3- Performance testing for compliance with CO limit, or installation of a CO CEMS for alternative CO w/CEMS limit. Units 9 & 10 already have CO CEMS.

4- Annual Boiler MACT performance test for 2-years w/ subsequent test every 3rd year if <75% of standards

* Compliance test data submitted electronically to EPA via ERT/CEDRI.

Table 8 Final Boiler MACT Continuous Compliance Monitoring

Boiler	MACT Status	Fuel	CEMs or CPMS Required					
			PM	TSM	HCl	HG	CO/O_2	Opacity
No.6 & No.7	Existing	Coal	Yes[1]	-	Yes[2]	Yes[2]	Yes[3]	-
		Biomass	-	-	Yes[2]	Yes[2]	Yes[3]	Yes[1]
No.8	Existing	No.2 Oil[4]	-	-	-	-	Yes[3]	-
		N. Gas	-	-	-	-	-	-
No.9 & No.10	Existing	No.2 Oil[4]	-	-	-	-	Yes[3]	-
		N. Gas	-	-	-	-	-	-

1- New PM CPMS or PM CEMS system required on B6 and B7 if classified as coal-fired units (<10% biomass). If classified as biomas units, existing opacity COMs or bag leak detection is sufficient.
PM CEMS or CPMS are the same CMS hardware/equipment. Difference is in mode of operation. Designated PM CPMS units must establish operating limit correlation at 75% of standard based on annual 3-run performance tests. Designated CEMS units may develop operating limit correlation at up to 100% of standard based on more extensive testing and QA/QC procedures outlined in 40 CFR 60 Performance Spec 11.

2- Existing sorbent injection rate CPMS (lbs coal/wood:lbs limestone ratio). Operating limit at the lowest 1-run average during last performance test.
There is an option for SO2 CEMS in lieu of monitoring sorbent injection rate for HCl continuous compliance. SO2 limit at highest rate during HCl performance test. Not an option for Hg monitoring.

3- A CO CEMs or O2 trim monitoring is required for CO limit compliance monitoring. O2 level for CO compliance established during initial CO performance test. O2 limit at the lowest 1-hr average during CO performance tests.

4 -No.2 oil limits and monitoring requirements do not apply to units if oil is only used during natural gas curtailments. Units would be classified as Gas 1 and only subject to tuneup requirement.

Table 9 Final Boiler MACT Reporting Requirements*

Boiler	MACT Status	Mode	Initial Notification	Performance Test[1]	Compliance Status Report[7]	Monitoring Plan[3]	S&S[9] Plan	Semiannual Report	Tuneup Report	N. Gas Curtailment
No.6	Existing	General	Yes					Yes	If requested	
		PM		Yes	Yes	Yes	Yes			
		HCl		Yes[2]	Yes	Yes	Yes			
		Hg		Yes[2]	Yes	Yes	Yes			
		CO		Yes[5]	Yes	Yes	Yes			
No.7	Existing	General	Yes					Yes	If requested	
		PM		Yes	Yes	Yes	Yes			
		HCl		Yes[2]	Yes	Yes	Yes			
		Hg		Yes[2]	Yes	Yes	Yes			
		CO		Yes[5]	Yes	Yes	Yes			
No.8	Existing	General	Yes					Yes[8]	If requested	Yes[6]
		PM		Yes[4]	Yes	Yes[4]	Yes[4]			
		HCl		Yes[4]	Yes	Yes[4]	Yes[4]			
		Hg		Yes[4]	Yes	Yes[4]	Yes[4]			
		CO		Yes[4,5]	Yes	Yes[4]	Yes[4]			
No.9	Existing	General	Yes					Yes[8]	If requested	Yes[6]
		PM		Yes[4]	Yes	Yes[4]	Yes[4]			
		HCl		Yes[4]	Yes	Yes[4]	Yes[4]			
		Hg		Yes[4]	Yes	Yes[4]	Yes[4]			
		CO		Yes[4,5]	Yes	Yes[4]	Yes[4]			
No.10	Existing	General	Yes					Yes[8]	If requested	Yes[6]
		PM		Yes[4]	Yes	Yes[4]	Yes[4]			
		HCl		Yes[4]	Yes	Yes[4]	Yes[4]			
		Hg		Yes[4]	Yes	Yes[4]	Yes[4]			
		CO		Yes[4,5]	Yes	Yes[4]	Yes[4]			
SB-6	Existing	General	Yes					Yes[8]	If requested	

1 - Performance tests are initial and annual. Annual may be reduced to every third year if 2 consecutive years are <75% of standard. Notification of testing 60-days prior.
2 - Fuel analysis may be performed in lieu of emissions test. If used, must submit fuel monitoring plan.
3 - For each CMS, 60 days before performance test.
4 - No.2 oil limits and reporting requirements do not apply to units if oil is only used during natural gas curtailments. Units would be classified as Gas 1 and only subject to tuneup requirements.
5 - May be a performance test or a CO CEMS certification.
6- Only necessary if unit is classified as a Gas 1 unit, not subject to oil-fired unit emission limits.. Submit notification within 48-hrs of declaration of gas curtailment.
7- Compliance Status Report within 60-days of completion of all performance test. If no performance test required, within 60-days of compliance date.
8- If classified as Gas 1 unit (oil during gas curtailments only), compliance report evry 5-yrs only for tuneups.
9-Startup and shutdown plan required if startup period is based on 4 hr alternative definition in 63.7575.

Reports supported by ERT must be submitted to EPA via CEDRI.